

6-19-97 II

**SITE ASSESSMENT REPORT
FOR
76TH & ALBANY SITE
CHICAGO, COOK COUNTY, ILLINOIS
TDD S05-9611-009
PAN 6B0901SI**

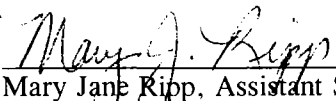
June 19, 1997

Prepared for:

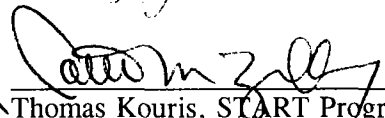
**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Emergency Response Branch
77 West Jackson Boulevard
Chicago, Illinois 60604**

Prepared by: 
for Steve Skare, START Project Manager

Date: 6/19/97

Reviewed by: 
Mary Jane Ripp, Assistant START Program Manager

Date: 6/19/97

Approved by: 
for Thomas Kouris, START Program Manager

Date: 6/19/97



International Specialists in the Environment

33 North Dearborn Street, Chicago, Illinois 60602
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ecology and environment, inc.

International Specialists in the Environment

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June 19, 1997

Gail Nabasny
Project Officer
Emergency Support Section
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604

Re: 76th & Albany Site
Chicago, Cook County, Illinois
TDD: S05-9611-009
PAN: 6B0901SI

Dear Ms. Nabasny,


On November 13, 1996, the United States Environmental Protection Agency (U.S. EPA) tasked the Ecology and Environment, Inc. (E & E) Superfund Technical Assessment and Response Team (START), under Technical Direction Document (TDD) No. S05-9611-009, to assist U.S. EPA with a site assessment at the 76th & Albany site in Chicago, Cook County, Illinois. The site is the location of a former illegal waste dump with waste piles contaminated with lead and polychlorinated biphenyls. The following letter report describes activities associated with this TDD.

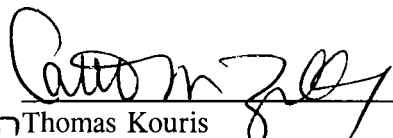
START assisted the U.S. On-Scene Coordinator (OSC) Brad Benning with coordinating bids for a drilling subcontractor to collect subsurface soil samples in support of a site assessment. The purpose of the sampling effort was to determine the aerial and vertical extent-of-contamination at the 76th & Albany site. START prepared the subcontract and accompanying documentation (Attachment A); submitted and received bids from prospective bidders; and awarded the subcontract to the winning bidder. START also prepared a draft Quality Assurance Sampling Plan (Attachment B).

Field work was first suspended and later canceled by U.S. EPA. START contacted the subcontractor to formally cancel the subcontract. This report completes the requirements of the TDD.

If you should have any questions or require additional information, please contact our office.

Sincerely,


for Steven J. Skare
START Project Manager


for Thomas Kouris
START Program Manager

Attachments: Attachment A - Drilling Subcontract
Attachment B - Draft Quality Assurance Sampling Plan

cc: Brad Benning, U.S. EPA OSC, Region 5
TDD File

Attachment A

Drilling Subcontract



ecology and environment, inc.

International Specialists in the Environment

33 North Dearborn Street
Chicago, Illinois 60602
Tel. 312/578-9243, Fax: 312/578-9345

DATE: November 25, 1996

TO: Prospective Bidder

FROM: Steven J. Skare, E & E, Inc.
START Project Manager

RE: Drilling Subcontract
76th & Albany Site
TDD: S05-9611-009
PAN: 6B0901SIXX

Dear Sirs:

Please find enclosed Exhibit 1: Bid Specifications for exploratory soil borings at the 76th & Albany Site located in Chicago, Cook County, Illinois. Work is scheduled to begin on Monday, December 16, 1996.

Bids for the subcontract must be received by myself at the above address no later than Monday, December 9, 1996. If you have any questions or comments, please contact me at the above telephone number. Thank you for your consideration of this bid package.

Yours Sincerely,

Steven J. Skare
START Project Manager

EXHIBIT ONE

BID SPECIFICATIONS

**EXPLORATORY SOIL BORINGS
AT THE 76th & ALBANY SITE
CHICAGO, COOK COUNTY, ILLINOIS**

**TDD: S05-9611-009
PAN: 6B0901SIXX**

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1. GENERAL INFORMATION

Ecology and Environment, Inc., (E & E), with its headquarters at 368 Pleasantview Drive, Lancaster, New York and a business office at 33 North Dearborn Street, Suite 900, Chicago, Illinois, has entered into a contract (Contract Number 68-W6-0011) with the United States Environmental Protection Agency (U.S. EPA) Region 5, to furnish technical, engineering, and managerial services, in support of the Superfund Technical Assessment and Response Team (START) contract at uncontrolled hazardous substance disposal sites.

E & E is currently in the process of conducting a site assessment (SA) of the 76th & Albany Site in Chicago, Cook County, Illinois. See Appendix A for site maps. As part of the SA, it is necessary to take between 20 to 25 soil borings to determine if, and to what extent, hazardous wastes have been disposed at the site. The borings will be drilled in waste pile areas where hazardous wastes are suspected to have been disposed between 0 to 30 feet above the existing grade.

1.1 SITE DESCRIPTION AND HISTORY

The 76th & Albany site covers an area four city blocks square, located two blocks north of the end of Albany Street at 76th Street in Chicago, Cook County, Illinois (Appendix A). Coordinates for the site are latitude 41° 45' 20" North and longitude 87° 42' 08" West, as measured using a hand-held Global Positioning System (GPS) device.

Illegal refuse dumping has allegedly occurred on the northern and southern portions of the site. The northern portion of the site contains waste disposed in two distinct areas: the east area and the west area. The east area contains fill regions of unknown depths consisting of soil, auto fluff, and construction debris such as asphalt, bricks, concrete, metal, plastic, slag, wood, and roofing shingles. The southern portion of the site contains concrete, asphalt, and visible auto fluff.

On February 22, 1995, the Illinois Environmental Protection Agency (IEPA) initiated a cooperative effort with the City of Chicago for investigation and enforcement activities, including eventual remediation at the site. On December 13, 1995, a pre-enforcement conference was held between representatives of IEPA and one potentially responsible party (PRP), the Renella-Palumbo Company. The Renella-Palumbo Company owns property adjacent to the west side of the site. At this meeting, Renella-Palumbo committed to conduct sampling of the west area of the site.

On March 15, 1996, U.S. EPA On-Scene Coordinator (OSC) Brad Benning and START members Karen Rydzewski and Todd Murphy conducted a site assessment of the 76th and Albany site. A transient camp was observed in a wooded area on site, and several children walked on site during the site assessment.

Thirteen test pits were excavated using an excavator. The test pits were approximately 8 feet long, 4 feet wide, and varied in depth between 5 and 20 feet, depending on the extent of the fill material encountered or on the ability of the excavator to penetrate the material. The excavated material was placed in stockpiles, visually examined, and air monitored for volatile organic compounds (VOCs), oxygen, lower explosive limit (LEL), and radiation levels at several locations in the pile. No oxygen, LEL, or radiation level stockpile readings above background (upwind) were encountered.

START collected composite soil samples from 11 of the 13 pits and a composite surface soil sample. The samples were analyzed for polychlorinated biphenyls (PCBs), toxicity characteristic leachate procedure (TCLP) metals, VOCs, and semivolatile organic compounds (SVOCs). TCLP lead and PCBs were detected in several of the samples collected.

2. INFORMATION TO BIDDERS

Questions with respect to technical work should be directed to the attention of E & E START Project Manager Steven Skare or Assistant START Program Manager Patrick Zwillig at (312) 578-9243. Questions concerning contract procedures should be addressed to Mary Ann Spidalette, START Subcontracts Manager at the same number.

The work will not require more than seven 8-hour days to complete and will probably require only five 8-hour days. The work is expected to begin as early as Monday December 16, 1996. The subcontractor will be expected to notify E & E if any imminent scheduling conflicts exist which would prevent work from proceeding in an expeditious manner. E & E will notify the subcontractor of any schedule changes.

The goal of the soil boring is to determine extent of contamination of hazardous materials that were disposed on site in a surface pile. Between 20 to 25 borings will be installed in the reported location of the pile. The exact number of borings to be installed, and the exact locations and depth of the borings, will be determined in the field. These decisions will be based on observations of the subsurface material; drilling into acutely hazardous materials will be kept to a minimum. The upper 10 feet of the borings will not be sampled; borings below 10 feet will be sampled using a split spoon.

Before commencing site work, E & E will discuss site safety, emergency procedures, and decontamination requirements with the subcontractor. Subcontractor personnel will be required to sign a form verifying their understanding of site safety and emergency procedures. The subcontractor must furnish their own site-specific health and safety plan to E & E prior to any site work (Section 8, Item 1). The subcontractor is expected to have at least two persons on site for the duration of the project. It is the subcontractor's responsibility to have sufficient personnel available to cover any unanticipated crew changes.

3. SCOPE OF WORK

The work to be performed includes the furnishing of all materials, labor, and equipment necessary for access to, drilling, sampling, and abandonment of borings; decontamination of equipment; and containerizing cuttings and decontamination water. In general, all drilling and sampling operations will conform to the American Society for Testing and Materials (ASTM) method D-1586-84 standards, unless otherwise designated.

3.1 SITE MOBILIZATION AND DEMOBILIZATION

The subcontractor shall provide and transport all personnel, equipment, materials, and supplies to and from the site which are necessary for completion of this scope of work. Mobilization tasks also include setting up all support facilities as required by the Occupational Safety and Health Administration (OSHA) and in accordance with E & E safety policies.

3.2 SOIL BORING PROCEDURES

Rotary drilling will be used to complete the boreholes. The upper 10 feet of each borehole will not be sampled; the remainder of each borehole will be sampled using a hollow stem auger and split spoon. All borings will be drilled using a method which does not interfere with valid sample collection methods. E & E recommends using a 3.25-inch inner diameter (ID) hollow-stem auger (HSA) technique for the intervals to be sampled. The subcontractor will be expected to upgrade safety requirements in the event that liquid waste or volatile organic compounds are encountered.

Between 20 to 25 borings will be made in the area of the above ground surface pile, where hazardous materials are suspected to have been disposed. The exact number of borings to be installed, and the exact locations and depth of the borings will be determined in the field. These decisions will be based on observations of the subsurface material. There is a possibility that below-grade (underground) drilling may occur. If subsurface obstacles (i.e.,

large rocks or concrete) which preclude drilling are encountered, the boring will be abandoned and relocated.

The subcontractor will enter a bid based on this drilling method. However, if the subcontractor can justify an alternative method, a second bid may be entered based on the alternative method. The subcontractor must clearly stipulate the proposed alternative drilling technique in the proposal. Any technique differing from that recommended by E & E will be subject to approval by E & E.

3.3 SOIL SAMPLING

The subcontractor will obtain representative samples of soil at 5-foot intervals, beginning at a depth of 10 feet below the surface of the waste pile, and thereafter until the boring is complete, unless otherwise instructed. The borings are not expected to be greater than 50 feet in total depth. The split spoon will be placed on a table and opened by the subcontractor.

E & E and U.S. EPA will examine and sample each core as necessary.

The split spoon sampler will be cleaned by the subcontractor before each sample is collected. The cleaning process is described in Section 3.5.

The subcontractor will have at least two split spoons available on the drill rig upon mobilization and thereafter until job completion.

3.4 BACKFILLING BOREHOLES AND CONTAINERIZATION OF WASTES

Boreholes will be abandoned in accordance with applicable state regulations. Materials from the upper 10 feet of the debris pile have been screened, sampled, analyzed, and determined to be nonhazardous. Cuttings from this interval will be isolated and used to backfill the boreholes. The subcontractor will add bentonite to the backfill material if groundwater is encountered.

Cuttings from the intervals below 10 feet will be containerized by the subcontractor and stored on site. The containers to be used will be the U.S. Department of Transportation (DOT)-approved steel drums with open lids. The subcontractor shall stage the containers on site in an area identified by U.S. EPA and E & E. The subcontractor shall provide all equipment, materials, personnel, and supplies necessary to complete this task. The subcontractor will not be responsible for sampling or disposal of the cuttings.

3.5 DECONTAMINATION

The subcontractor is expected to arrive on site with a drill rig and equipment free from all oil, grease, mud tar, etc. Prior to demobilization, the subcontractor will clean the drill rig and equipment as necessary to prevent spreading of potentially hazardous materials from the site to off-site areas, and to ensure safe operation of the rig.

Before drilling each boring, the augers, cutting bits, and drilling rods which contacted potentially hazardous materials, shall be cleaned. The cleaning process will include manual scraping of accumulated soils, a high pressure hot water/detergent wash, and a clean water rinse, unless otherwise directed. Special attention must be given to the inside and threaded sections of drill rods; petroleum lubricants will not be used to prevent binding.

Decontamination of the split spoons used for sampling will consist of initially scrubbing the split spoon with trisodium phosphate (TSP) and water, a rinse, then a triple rinse with distilled water, in that order. An alternative decontamination procedure may be used upon approval by E & E.

The subcontractor shall provide all cleaning supplies, equipment, and means to contain washwater. Decontamination water will be contained in DOT-approved steel or plastic barrels. The subcontractor will not be responsible for sampling or disposal of the decontamination water.

4. DISPOSAL OF INVESTIGATION-DERIVED WASTE

Used personal protection equipment (PPE), spent decontamination water, and other expendable materials which contacted potential hazardous waste, will be handled as hazardous waste until determined by U.S. EPA and E & E to be otherwise. These materials will be contained in a sealable steel drum or other DOT-approved container and staged on site along with the cuttings in an on-site area determined by U.S. EPA and E & E. Disposal requirements will be determined and arranged by U.S. EPA and E & E.

5. SITE SAFETY

Complete information on the nature of material disposed at the site is not available. Samples results from several test pits on site indicate that the construction/demolition debris waste piles are composed of potentially hazardous waste. This material occurs above the natural grade of the site. Many locations of these waste piles have not been sampled and no information is available on the nature of material disposed in subsurface locations. Constituents anticipated to be encountered may include, but are not limited to polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), lead, cadmium, chromium, mercury, heavy hydrocarbons (motor oil), volatile constituents of gasoline (benzene, toluene, ethylbenzene, and xylene) and asbestos. See Appendix B for hazard evaluations of these chemicals.

Upon mobilization the subcontractor will be prepared to perform work at protection levels up to and including level C. The subcontractor will provide its employees with all necessary safety apparatus, and training in use of the apparatus. See Appendix C for recommended level of protection guidelines.

The level of protection necessary for drilling through the upper 10 feet of construction/demolition debris is anticipated to be level D. Requirements for upgrading the level of protection for drilling below the waste pile will be detailed in the site safety plan submitted by the subcontractor to E & E for approval prior to mobilization.

The subcontractor agrees to comply with the requirements set forth in OSHA regulation 29 Code of Federal Regulations (CFR) 1910 and specifically confirms that all subcontractor personnel to be engaged in field activities are physically able to perform said work, and are in proper physical condition to utilize appropriate respiratory equipment and have completed requisite hazardous waste site operations training in accordance with 29 CFR 1910. As confirmation of this, the subcontractor is required to submit to E & E prior to commencement of the project: 1) statement of medical fitness (Appendix D); 2) completion of 40-hour OSHA hazardous waste site operations training, including health and safety protocols

and annual refresher; and 3) certification of passage of a qualitative respirator fit test which specifies the type of respirator tested. Items 2 and 3 can be addressed in letter format, but must include the name and address of the training facility and dates of training and fit test (Appendix E and F). These documents must be valid for all subcontractor employees engaged in field activities at the site.

The subcontractor will ensure that all subcontractor employees are physically capable of completing said work at the required level of protection. E & E reserves the right to remove from the site any worker showing signs of stress or injury. Persons so removed will be transported to the nearest hospital. Downtime from personnel shortages will not be billed to the project.

6. CONTRACT PARTICULARS

The subcontractor will, on its own time and at its own expense, ensure that all required permits, licenses, and certificates are obtained. Additionally, the subcontractor will comply with all federal, state, and local laws, ordinances, rules, and regulations, relating to the scope of work.

The subcontractor is responsible for contacting all utility companies and verifying the locations of all existing underground cables, gas mains, or utilities in the field. E & E will coordinate access to the site and its environs for the subcontractor and utility companies during this process. The drilling locations will be chosen to avoid any damage to existing utilities. During the progress of the work the subcontractor will cooperate with the owners of the utilities and permit their representatives access to the work area to determine if their utilities are endangered in any way.

Should boulders or other obstructions be encountered, the subcontractor shall attempt to redrill in an area designated by E & E in an attempt to avoid the obstruction and penetrate the soil. The contractor shall be paid for the depth reached for all drilling attempts. If it is necessary to move a borehole to a new location, the new location will be designated by a new boring number. All boring locations will be marked in the field by E & E personnel.

The contract bid items will include all services, labor, equipment, transportation, material, and supplies needed to complete the work. Payment for these items will be provided in the compensation for drilling, and will include drilling in areas of difficult access; obtaining soil samples; recording and submitting data incidental to each item; and possible waste containerization costs.

A daily work sheet will be prepared to summarize the work completed and costs; this sheet will be signed by the designated representative from E & E and the subcontractor.

Any downtime incurred by the subcontractor, other than at the request of E & E, will not be a payment item. No payment will be made for drilled holes abandoned without

authorization of E & E, or for drilling holes for which satisfactory samples and data are not submitted.

Prior to the start of field operations, the subcontractor will designate a foreman or representative, who will be the only individual authorized to discuss work schedules and related matters with E & E personnel.

Upon completion of the field work, complete drilling logs of all borings will be delivered, at the expense of the subcontractor, to the office of Ecology and Environment, Inc., 33 North Dearborn Street, Suite 900, Chicago, Illinois, 60602, Attention: Steven Skare.

7. BID PARTICULARS

The quantities and items stated on the bid sheets (Appendix H) are E & E's best approximation of the scope of work and are for the specific purpose of comparing bids. E & E does not guarantee that the bid quantities are correct or that the stated tasks will be performed. E & E reserves the right to vary the quantities or delete items in their entirety, and the subcontractor will not be entitled to any extra payment over the rates bid to such amended quantities or deleted items. It must be stated that at this time every item discussed in the scope of work is expected to be performed under this contract.

Bids will be accepted only for the entire scope of work. The subcontractor must submit a bid for work at level D and level C. In the event that the subcontractor proposes an alternative drilling technique, an additional set of bid sheets for the scope of work at each level of safety will be required. E & E will consider all sets of unit costs in selecting a bidder. Portions of individual bid items are anticipated to be performed at each level of protection. The total contract cost will be based on the anticipated proportional costs of work performed at each level of protection.

The following documentation must accompany the completed bid sheets.

A. A letter addressing the following items:

1. A statement that all work will be performed in accordance with the standard specifications and will be acceptable as evidence in a court of law;
2. A statement that the subcontractor will be able to begin work on December 16, 1996;
3. The names of at least three references which E & E may contact; in particular, those for which the subcontractor has had experience drilling at hazardous waste/chemical spill sites;

4. The type and make of drilling equipment, support vehicles, and decontamination equipment to be used and proposed method of drilling;
 5. Specifications for any optional item required by this request for bid (Subsection 3.1 drilling techniques);
 6. Any deviations from technical specifications or estimated quantities presented in this request for bid and the reason for that deviation, and;
 7. Applicable State certifications or licenses.
- B. Proof of minimum insurance coverage including \$ 1,000,000 in pollution liability and \$ 1,000,000 in general liability coverage.
- C. Completed Representations and Certifications Regarding Subcontractor Status Form (Appendix E).
- D. Signed copies of the attached statement of Health and Safety Training (Appendix F) and the attached Statement of Medical Fitness (Appendix D)

Bids for the specified work will be received by Steve Skare, Project Manager, Ecology and Environment, Inc., 33 North Dearborn Street, Suite 900, Chicago, Illinois, 60602, no later than 5:00 p.m., central standard time on Monday, December 9, 1996. Completed bids may be faxed, in lieu of a hard copy, to Mr. Steven Skare at (312) 587-9345. The bid package should have the following markings on the lower left corner of the envelope: Bid for 76th & Albany Site (TDD: S05-9611-009).

The authorization to proceed with work by the selected bidder will be under a subcontract issued by E & E. A fixed-price type contract, with provisions for lump sum items, will be used.

The bid must be reviewed and approved by E & E. E & E and U.S. EPA reserve the right to accept the bid most advantageous to the completion of the work or to reject any or all bids as they may determine in their sole and absolute discretion, and to proceed no further in this matter.

The subcontract will be awarded to the company submitting the bid which is most cost effective to the government and is deemed able to meet the technical requirements of this project.

8. BID ITEMS

Item 1. Prepare and submit a site-specific health and safety plan

This item will include preparation of a site-specific health and safety plan, which will cover all work to be performed on site by subcontractor personnel. The plan will include a description of all respiratory and protective equipment to be used for work at level D and level C; and will address all contaminants listed in Section 5 of the Bid Package, and described in Appendix B. The plan will describe conditions necessary to require an upgrade to level C. The plan will include a hospital route map and emergency phone numbers.

Item 2. Mobilization and demobilization

This item will carry all charges incidental to equipment setup and removal, in order that the charges need not be distributed among the more variable items of the contract. This item will be paid at the contract lump sum price for mobilization and demobilization and will include the furnishing of personnel, machinery, tools, and all other equipment necessary to carry on and complete the work properly. All material or equipment furnished under this item will remain the property of the subcontractor and will be maintained, cared for, and disposed of by the subcontractor. This item will also include any costs anticipated by the subcontractor for utility clearance prior to drilling, personal safety equipment and supplies, and movement of containers of investigation-derived waste to a central location on site.

Item 3a. Soil borings without sampling

This item will be paid for at the respective contract unit prices per linear foot of drilling at safety level D through the upper 10 feet of nonhazardous material. This work will be measured for payment by the actual number of vertical linear feet drilled for each accepted hole between the ground surface at the hole and the bottom of the hole prior to the

commencement of sampling the borehole, or completion of the borehole if sampling is not possible or not deemed necessary.

Item 3b. Soil borings with sampling

This item will be paid for at the respective contract unit prices per linear foot of drilling and sampling at level D, through the portion of each accepted borehole beginning at 10 feet below the surface of the waste pile and extending to the bottom of the borehole, or the last soil sample taken, whichever is deeper. This item will include the furnishing of a complete borehole record as outlined in the specifications.

Item 3c. Upgrade to level "C" protection

This item will include extra payment for work performed by subcontractor personnel in conditions where a full-face respirator with National Institute for Occupational Safety and Health (NIOSH)-approved filters is decided to be necessary for respiratory protection, and while subcontractor personnel are wearing the respirator, as required. The decision to upgrade to level C will be agreed upon by E & E and the subcontractor prior to proceeding with work and will be based upon guidelines set forth in the subcontractor safety plan.

Item 4. Delay time

If work by the subcontractor is delayed by more than 30 minutes as a result of actions by E & E, the subcontractor will be entitled to reimbursement for each delay in excess of 30 minutes. Both the subcontractor and E & E will jointly record and verify any such instances and the time involved in excess of 30 minutes. At project completion, the subcontractor will be paid for the accumulated totals of these delays. Payment will be at the hourly rate as bid. Payment does not include time for difficult moving.

Item 5. Difficult moving time

This item will include only charges for time in excess of 30 minutes required to move equipment on and off specific boring locations where access is judged to be more difficult than normally encountered.

Item 6a. Backfilling of boreholes

This item will include costs for time spent backfilling. Payment will be made for backfilling on a linear foot basis.

Item 6b. Materials for backfilling of boreholes

This item will include the cost of bentonite grout used to backfill boreholes if the water table is reached. The contractor will be expected to provide ten 50-pound bags of bentonite pellets for use as needed, according to Illinois state regulations. The subcontractor may be required to provide additional bentonite pellets as needed.

Item 7. Decontamination

This item will include time spent in decontaminating splitspoons, augers, drilling rods and other equipment between borings. The price will include the cost of materials used.

Item 8a. Waste collection/containerization

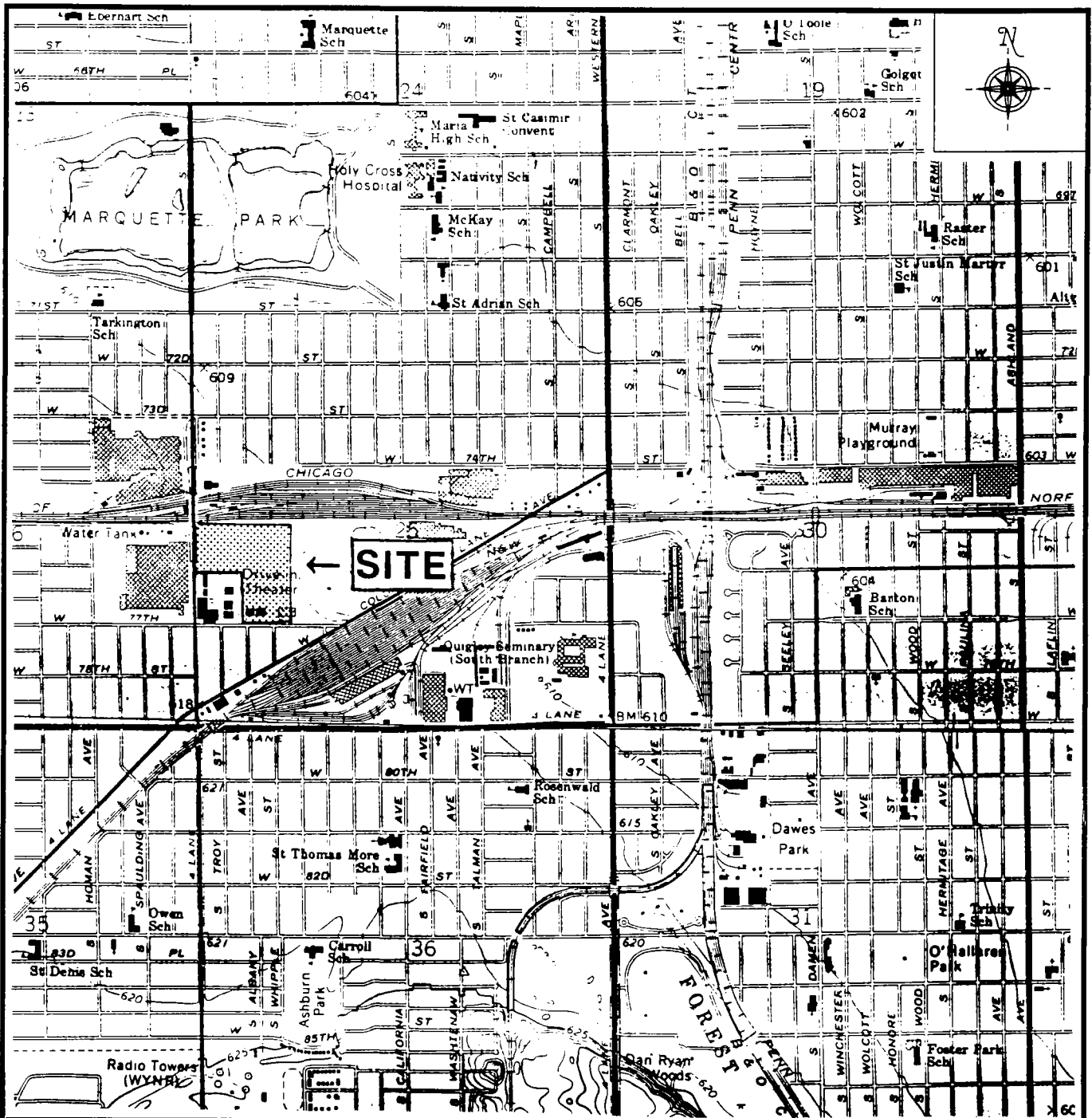
This item will include time spent in collecting and containerizing wastes derived in connection with the work described in these specifications and deemed potentially hazardous by E & E (cuttings, decontamination water, PPE). Those waste materials deemed by E & E not to be known/suspected hazardous wastes do not have to be collected or disposed off site. Potentially hazardous wastes will be segregated according to liquid/sludge or solid phase.

Item 8b. Waste containers

This item will include DOT-approved drums for containment of investigation-derived waste. At a minimum the subcontractor will provide ten 55-gallon steel open-top drums at the initiation of the project. The subcontractor may be required to provide additional drums as needed. Any drums not used will remain the subcontractors property and will not be considered billable items.

APPENDIX A

SITE MAPS



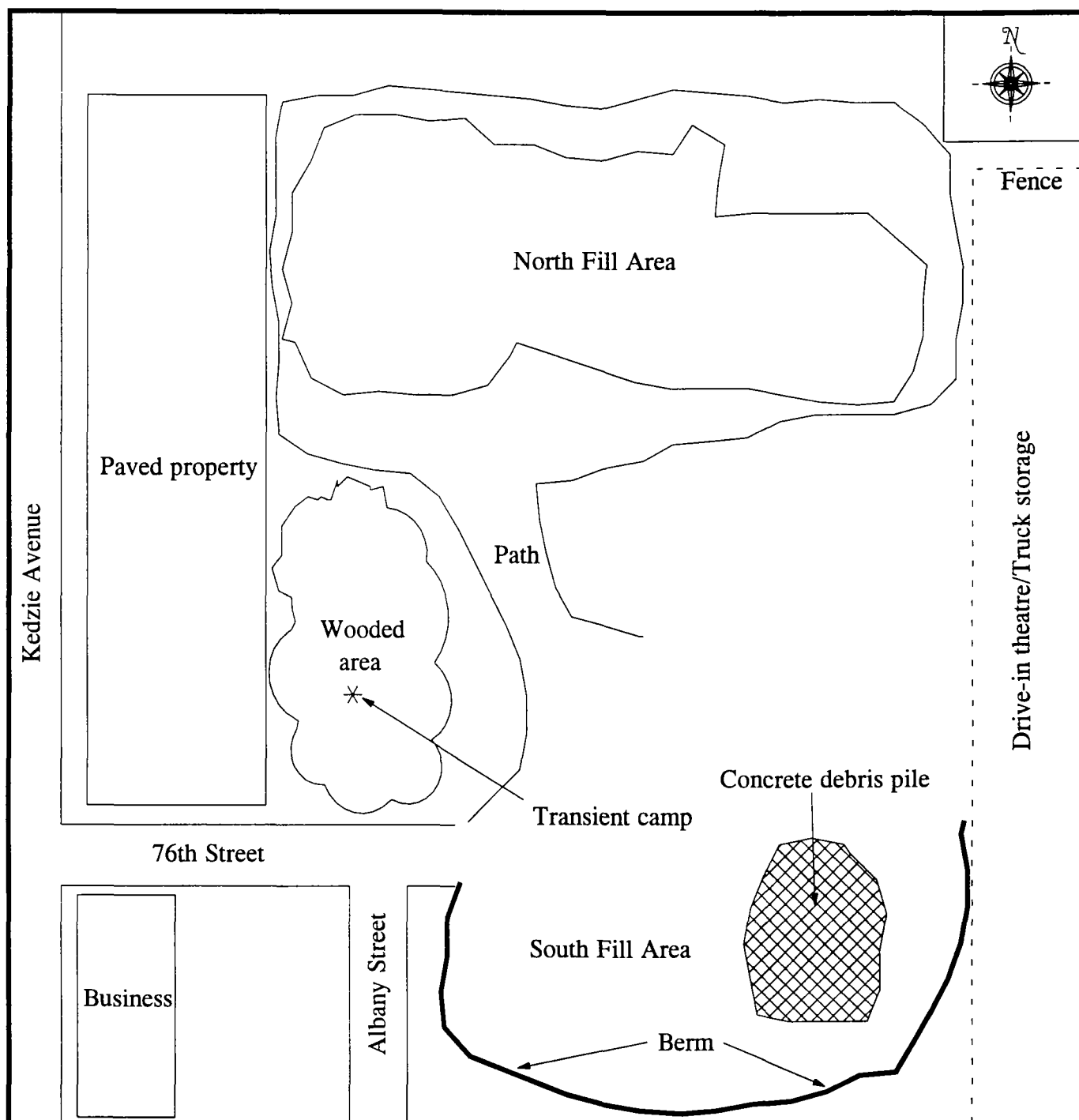
Quadrangle Location



ecology and environment, inc.

Region 5 - Superfund Technical Assessment and Response Team
111 West Jackson Boulevard, Chicago, Illinois 60604

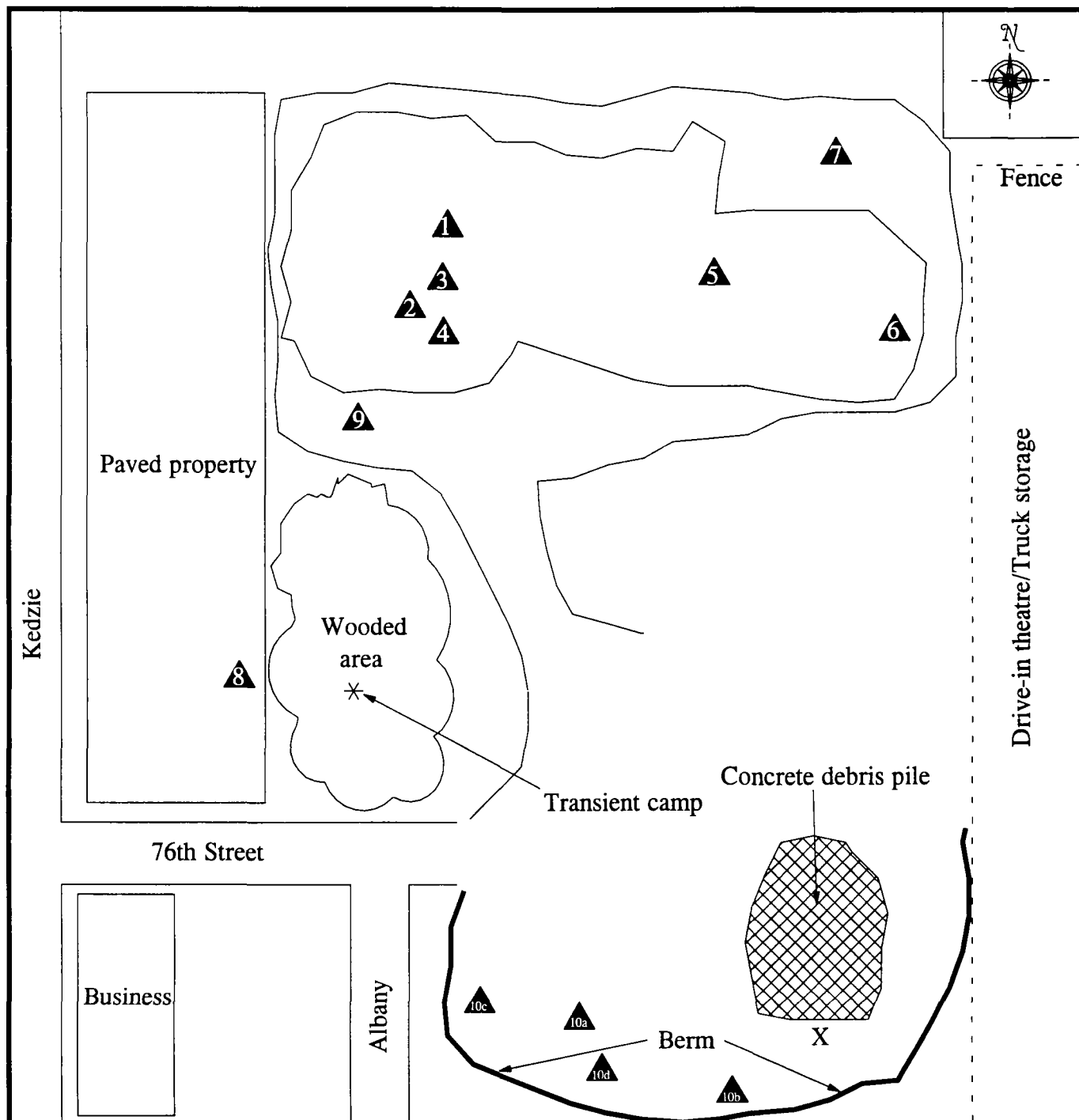
TITLE	Site Location Map	FIGURE #	N/A
SITE	76th & Albany	SCALE	1 in = 2,000 ft
CITY	Chicago	STATE	Illinois
SOURCE	U.S.G.S. Topographical 7.5 Minute Series Englewood and Blue Island, Illinois Quadrangles	TDD	S05-9611-009
		DATE	1963
		REVISED	1980



ecology and environment, inc.

Region 5 - Superfund Technical Assessment and Response Team
33 North Dearborn Street, Chicago, Illinois 60602

TITLE	Site Features Map	FIGURE #	N/A
SITE	76th & Albany	SCALE	Not to Scale
CITY	Chicago	STATE	Illinois
SOURCE	Ecology and Environment, Inc.	TDD	S05-9611-009
		DATE	1996
		REVISED	




Legend

▲ = Pit location/number

X = Dead tree

▲_{10a} = Composite sample point

 ecology and environment, inc. Region 5 - Superfund Technical Assessment and Response Team 33 North Dearborn Street, Chicago Illinois 60602		
TITLE	Test Pit and Sample Location Map	FIGURE # N/A
SITE	76th & Albany	SCALE Not to Scale
CITY	Chicago	STATE Illinois
SOURCE	Ecology and Environment, Inc.	TDD S05-9611-009
		DATE 1996
		REVISED

APPENDIX B

HAZARD EVALUATION OF CHEMICALS

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-8-90

CHEMICAL NAME: ASBESTOS

CAS NUMBER: 1332-21-4 DOT NAME/ID NO.:

RQ:

SYNONYMS: CHRYSOTILE, AMOSITE, CROCIDOLITE, TREMOLITE, ANTHOPHYLLITE, ACTINOLITE

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: VARIES MOLECULAR WEIGHT: N/A PHYSICAL STATE: SOLID SPG/D SOLUBILITY (H2O): NON-SOLUBLE
VAPOR PRESS: N/A FREEZING POINT: N/A BOILING POINT: N/A FLASH POINT: N/A FLAMMABLE LIMITS: N/A
ODOR CHARACTERISTICS: N/A
INCOMPATIBILITIES: NONE

BIOLOGICAL PROPERTIES:

TOXICITY DATA: LD50 1.5 g/kg (RAT) LD50 1.5 g/kg (MICE) LD50 1.5 g/kg (RATS) LD50 1.5 g/kg (MICE)
HUMAN (LD50) RATE: USE (LD50) AQUATIC TOXICITY: 1.5 g/kg (RAT) 1.5 g/kg (MICE) 1.5 g/kg (RATS) 1.5 g/kg (MICE)
CARCINOGEN TREATMENT: MULDGEN
ROUTE OF EXPOSURE: (X) INHALATION (X) EYE CONTACT (X) SKIN CONTACT (X) INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

HEPA FILTERS WITH AIRPURIFYING UP TO OIL FIBER/FAC AIR SUPPLIED, FULL BODY DISPOSABLE COVERING, HODD, GLOVES & BOOTS IF NOT IN FULL FACE PIECE
RESPIRATOR WEAR EYE PROTECTION

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: ASBESTOSIS, LUNG CANCER & POSSIBLE GI TRACT CANCER, MESOTHELIOMA AND CARCINOGENIC PROPERTIES GREATLY ENHANCED BY CIGARETTE
SMOKE. EXPOSURE TO ASBESTOS CAN CAUSE SHORTNESS OF BREATH, CHEST OR ABDOMINAL PAIN AND IRRITATION OF THE SKIN AND MUCCUS
ACUTE SYMPTOMS: NONE

CHRONIC SYMPTOMS: ASBESTOSIS, LUNG CANCER & POSSIBLE GI TRACT CANCER, MESOTHELIOMA AND CARCINOGENIC PROPERTIES GREATLY POTENTIATED BY CIGARETTE
SMOKE

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH ASBESTOS
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER
INGESTION: DO NOT INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE (X) ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: CHRIS (VOL III)

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-8-90

CHEMICAL NAME: BENZENE

CAS NUMBER: 71-43-2 DOT NAME/ID NO.:

RQ:

SYNONYMS: BENZOL, BENZOLE, CYCLOHEXATRIENE, BENZOLENE, BICARBURET OF HYDROGEN, CARBON OIL, COAL NAPHTHA

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C6H6 MOLECULAR WEIGHT 78 PHYSICAL STATE: LIQUID SPG/D 0.879 SOLUBILITY (H2O): SLIGHTLY
VAPOR PRESS: 75MM FREEZING POINT: 42 F BOILING POINT: 176 F FLASH POINT: 12 F FLAMMABLE LIMITS: 1.3-7.1%
ODOR CHARACTERISTICS: 4.68 PPM
INCOMPATIBILITIES: STRONG OXIDIZERS, CHLORINE, BROMINE

BIOLOGICAL PROPERTIES:

ILLH ILL IWA 10 PPM PEL: 1 PPM ODOR THRESHOLD
HUMAN (LCLO) TCLO 100/CNS RAT/MOUSE (LC50) ICLO 50/ AQUATIC
CARCINOGEN HUMAN SUS TERATOGEN MUTIGEN: EXPER
ROUTE OF EXPOSURE [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

10 PPM USE SCBA, USE PROTECTIVE CLOTHING, EXCEL VITON;GOOD-NEOPRENE, SARANAX; POOR-BUTYL, NATURAL RUBBER FOR GLOVES, AVOID SKIN/EYE CONTACT

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: CAN CAUSE DIZZINESS, EUPHORIA, GIDDINESS, HEADACHE, NAUSEA, STAGGERING GAIT, WEAKNESS, DROWSINESS, RESPIRATORY IRRITATION, PULMONARY EDEMA AND PNEUMONIA, GASTROINTESTINAL IRRITATION, CONVULSIONS, AND PARALYSIS. CAN ALSO CAUSE IRRITATION TO SKIN, EYES
ACUTE SYMPTOMS: SKIN IRRITANT, CNS DEPRESSANT, MOSTLY IHL, INITIAL EXCITATION FOLLOWED BY HEADACHE, DIZZINESS, VOMITING, DELIRIUM, SEVERE EXPOSURE MAY SEE TREMORS, BLURRED VISION, SHALLOW RESP, CONVULSIONS
CHRONIC SYMPTOMS: ANOREXIA, DROWSINESS, ANEMIA, BLEEDING UNDER SKIN, REDUCED BLOOD CLOTTING;LIVER, KIDNEY, BONE MARROW DAMAGE, LEUKEMIA

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: DO NOT INDUCE VOMITING, GIVE WATER OR MILK, GET MEDICAL ATTENTION IMMEDIATELY

DISPOSAL/WASTE TREATMENT:

TOXIC FUMES OF CARBON DIOXIDE, CARBON MONOXIDE

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: CHRIS (VOL III), SAX, ALDRICH, RTECS

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-29-90

CHEMICAL NAME: CADMIUM DUST

CAS NUMBER: 7440-43-9 DOT NAME/ID NO.:
SYNONYMS: C1 77180

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: CD MOLECULAR WEIGHT: 112.40 PHYSICAL STATE: SOLID SPG/D 8.64 SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: FREEZING POINT: 609 F BOILING POINT: 1412 F FLASH POINT: FLAMMABLE LIMITS:
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: SULFUR SELENIUM, TELLURIUM, ZINC, HYDRAZOIC ACID, AMMONIUM NITRATE, POTASSIUM, OXIDIZING AGENTS & ACID

BIOLOGICAL PROPERTIES:

IDLH TLV TWA 001 PPM PEL 004 PPM ODOR THRESHOLD:
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: ANIMAL POS TERATOGEN: MUTIGEN: EXPER
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

APR DUSTY/WINDY CONDIT OR KNOWN HIGH CONCENT OR 1 BUT 5 PPM SCBA, COVERALL TYVEK, GLOVES BUTYL

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: NAU/VOMT, DIARRHEA, HEADACHE, MUSC ACHES, SALIVATION, ABDOM PAIN, COUGH FOAM/BLOOD SPUTUM, WEAKNESS, LEG PAIN

CHRONIC SYMPTOMS: NO SENSE OF SMELL, COUGH, DYSPNEA, WEIGHT LOSS, ANEMIA, IRRITABILITY, YELLOW-STAINED TEETH, LIVER/KIDNEY DAMAGE

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: GIVE MILK; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [X] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: RTECS, SIGMA-ALDRICH, HANDBOOK OF POISONING, OSHA

JOB NO 2T2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6/07/93

CHEMICAL NAME: Chromium

CAS NUMBER: 7440-47-3 DOT NAME/ID NO.:

RQ:

SYNONYMS: Chromium metals and insoluble salts

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: Cr MOLECULAR WEIGHT: 52 PHYSICAL STATE: Solid SPG/D 7.2 SOLUBILITY (H2O): insoluble
VAPOR PRESS: Variable FREEZING POINT: 3339 F BOILING POINT: 4842 F FLASH POINT: variable FLAMMABLE LIMITS: 23% LEL
ODOR CHARACTERISTICS: NA
INCOMPATIBILITIES: Strong Oxidizers.

BIOLOGICAL PROPERTIES:

TLH: 500 mg/m3 TLV TWA: NA PEL: 1.0 mg/m3 CLER THRESHOLD
HUMAN (LAD): RAT/MOUSE (LC50): AQUATIC
CARCINOGEN TERATOGEN MUTAGEN
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

Respiratory protection with GMC H cart. 55mg/m3 use SCBA
Skin protection (gloves and coveralls)

MONITORING RECOMMENDATIONS:

Particulates in air miniram

HEALTH HAZARDS:

ACUTE SYMPTOMS: contact dermatitis, ulceration of skin and nasal mucosa, irritation of eyes and mucous membrane

CHRONIC SYMPTOMS: Not available

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER
INGESTION: GIVE LARGE QUANTITIES OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

Segregate contaminated material, double bag, dispose of as hazardous material

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: Pattys Industrial Hygiene and Toxicology

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-22-90

CHEMICAL NAME: ETHYL BENZENE

CAS NUMBER: 100-41-4 DOT NAME/ID NO.:

RQ:

SYNONYMS: PHENYLETHANE, ETHYL BENZOL

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₂H₅C₆H₅ MOLECULAR WEIGHT 106 PHYSICAL STATE: LIQUID SPG/D 0.867 SOLUBILITY (H₂O): SLIGHTLY
VAPOR PRESS: 7.1 MM FREEZING POINT: -139 F BOILING POINT: 277 F FLASH POINT: 59 F FLAMMABLE LIMITS: 1.0-6.7%
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: OXIDIZERS, CLORE, OXYGEN

BIOLOGICAL PROPERTIES

LD ₅₀ 100 PPM	LD ₅₀ 100 PPM	LD ₅₀ 100 PPM	LD ₅₀ 100 PPM
HUMAN (ACUTE) 100 PPM	RAT/MOUSE (ACUTE) 400 PPM	AQUATIC 100-10 PPM	THRESHOLD 140 PPM
CARCINOGEN NEG	TERATOGEN		MUTAGEN NEG
ROUTE OF EXPOSURE	(X) INHALATION	(X) EYE CONTACT	(X) SKIN CONTACT (X) INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

100 PPM APR W/CHEMICAL CARTRIDGE, 2000 PPM SCBA, EXCEL VITON, POOR BUTYL, NATURAL; VAR-NEOPRENE, NITRILE

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: DO NOT INDUCE VOMITING MEDICAL ATTENT TO REMOVE BY GASTRIC LAVAGE, MOVE TO FRESH AIR, CPR IF NECESSARY, MEDICAL ATTENT, IRRIGATE IMMED W/WATER, WASH SKIN THOROUGHLY W/SOAP & WATER
ACUTE SYMPTOMS: IRRITATION OF SKIN, EYES, NOSE, MUCOUS MEMBRANES, DIZZINESS, CONSTRICTION OF CHEST, LACRIMATION, NAUSEA, HEADACHE, VOMITING, CNS DEPRESSION
CHRONIC SYMPTOMS: SKIN CONTACT MAY CAUSE ERYTHEMA & SKIN INFLAMMATION, NO OTHER DATA FOR CHRONIC EFFECTS

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE AMYL NITRITE PEARLS; GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER
INGESTION: DO NOT INDUCE VOMITING

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6-09-93

CHEMICAL NAME: LEAD

CAS NUMBER: 7439-92-1 DOT NAME/ID NO.:
SYNONYMS: WHITE LEAD, PLUMBUM

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: PB MOLECULAR WEIGHT: 207 PHYSICAL STATE: VARIABLE SPG/D 11.3 SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: VARIABLE FREEZING POINT: BOILING POINT: 3164 F FLASH POINT: INCOMBUST FLAMMABLE LIMITS: INCOMBUS
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: STRONG OXIDIZERS, PEROXIDES, ACTIVE METALS

BIOLOGICAL PROPERTIES:

IDH: VARIABLE TLV TWA: 0.05 mg/m3 PEL: 0.05 mg/m3 CLEAR THRESHOLD: NONE
HUMAN (LCLO) RAT/MOUSE (LC50): AQUATIC: UNKNOWN
CARCINOGEN: INDEF TERATOGEN: EXP MUTAGEN: INDEF
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

5 MG/M3 HIGH EFFICIENCY PARTICULATE RESPIRATOR, OTHER CONCENTRATIONS - SCBA, AVOID SKIN AND EYE CONTACT

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: SUSPECTED CARCINOGEN. POISON BY INGESTION. MAY CAUSE LOSS OF APPETITE, ANEMIA, MALAISE, INSOMNIA, HEADACHE, IRRITABILITY, MUSCLE AND JOINT PAINS, TREMORS, FLACID PARALYSIS, HALLUCINATIONS AND DISTORTED PERCEPTIONS, MUSCLE WEAKNESS, GASTRITIS AND LIVER
ACUTE SYMPTOMS: CUMULATIVE NEUROTOXIN-COMMONLY OCCURS FROM PROLONGED EXPOSURE, SYMPTOMS INCLUDE STOMACH DISTRESS, VOMITING, DIARRHEA, BLACK STOOLS, ANEMIA, NERVOUS SYSTEM EFFECTS
CHRONIC SYMPTOMS: 3 CLINICAL TYPES A-AILMENTARY-ABOMINAL PAIN, DISCOMFORT, CONSTIPATION OR DIARRHEA, METALLIC TASTE, LEAD LINE ON GUM, HEADACHE, B NUEROMUSCULAR, MUSCLE WEAKNESS, JOINT/MUSCLE PAIN, DIZZINESS, INSOMIA, PARALYSIS C-ENCEPHALIC BRAIN INVOLVEMENT, STUPOR, COMA, DEATH, RARE REPRODUCTIVE EFFECTS, HUMAN EPID STUDIES HAVE CONCLUDED THAT LEAD IS A POSION TO MALE & FEMALE GERM CELLS; INCREASED

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER
INGESTION: GIVE LARGE QUANTITIES OF WATER, INDUCE VOMITING; SEEK MEDICAL ATTENTION IMMEDIATELY

DISPOSAL/WASTE TREATMENT:

TOXIC FUMES OF LEAD

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH, RTECS, SITTIG

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-23-90

CHEMICAL NAME: MERCURY

CAS NUMBER: 7439-97-6 DOT NAME/ID NO.:

RQ:

SYNONYMS: QUICK SILVER, METALLIC MERCURY

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: HG MOLECULAR WEIGHT: 201 PHYSICAL STATE: MOBILE LIQUID SPG/D 13.59 SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: .0012 MM FREEZING POINT: -38 F BOILING POINT: 674 F FLASH POINT: NOT FLAM FLAMMABLE LIMITS: NOT FLAM
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: ACETYLENES, HALOGENS, STRONG OXIDIZERS, CHLORATES, NITRATES

BIOLOGICAL PROPERTIES:

LD50	LD50	LD50	LD50	LD50	LD50
HUMAN (LD50) 100 MG/M3	RAT (LD50) 100 MG/M3	MICE (LD50) 100 MG/M3	FEEL 05 MG/M3	PER TEST H 10	NONE
CARCINOGEN INDEX ANIMAL	TESTING ANIM				
ROUTE OF EXPOSURE	[X] INHALATION	[X] EYE CONTACT	[X] SKIN CONTACT	[X] INGESTION	MUTAGEN NEG

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

1. WEAR SUPPLIED AIR RESPIRATOR. AVOID CONTACT WITH BUTYL RUBBER, NITRILE, NEOPRENE. WELL VENTILATE THE AREA

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: METALLIC TASTE, ABDOMINAL PAIN, VOMITING, NAUSEA, BLOODY DIARRHEA, IRRITATION, COUGH, FEVER, NAUSEA, VOMITING, PULMONARY DISTURBANCES

CHRONIC SYMPTOMS: LIVER, KIDNEY DAMAGE, ANEMIA, SKIN DISORDERS, TREMORS, LOOSENING OF TEETH, NERVOUS DISORDERS, MENTAL

FIRST AID

INHALATION: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NEEDED. SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER

INGESTION:

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH, RTECS

JOB NO 2T2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5/13/93

CHEMICAL NAME: MOTOR OIL

CAS NUMBER: DOT NAME/ID NO.:

RQ:

SYNONYMS: ENGINE OIL, LUBRICATING OIL

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: VARIABLE MOLECULAR WEIGHT: NA PHYSICAL STATE: LIQUID SPG/D 0.8-0.9 SOLUBILITY (H2O) V. LOW
VAPOR PRESS: FREEZING POINT: -29.9 F BOILING POINT: NA FLASH POINT 275-600 F FLAMMABLE LIMITS
ODOR CHARACTERISTICS: OILY
INCOMPATIBILITIES: STRONG OXIDIZERS

BIOLOGICAL PROPERTIES:

HEALTH DATA: NOT LISTED ENV. DATA: NOT LISTED EEL: NOT LISTED E.R. DATA: NOT LISTED
HUMAN DATA: CARCINOGEN: RA1: MURDER: AQUATIC: MUTAGEN:
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

LEVEL: D

MONITORING RECOMMENDATIONS:

HMU OR OVA FOR VOLATILE FRACTIONS

HEALTH HAZARDS:

ACUTE SYMPTOMS: GI DISTURBANCES, PULMONARY IRRITATION IF INHALED

CHRONIC SYMPTOMS: NONE LISTED

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER

INGESTION:

DISPOSAL/WASTE TREATMENT:

DISPOSE OF AS LOCAL REGULATIONS SPECIFY

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [] SAX
[] NIOSH/OSHA POCKET GUIDE
[] OTHER:

JOB NO 272051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-23-90

CHEMICAL NAME: POLYCHLORINATED BIPHENYL

CAS NUMBER: 53469-21-9 DOT NAME/ID NO.:

RQ

SYNONYMS: AROCHLOR 1242/42A CHLORINE, CHLORODIPHENYL

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C12H7Cl13

MOLECULAR WEIGHT 258

PHYSICAL STATE: DARK LIQUID

SPG/D 1.3

SOLUBILITY (H2O): INSOLUBLE

VAPOR PRESS: 001 MM

FREEZING POINT: -2 F

BOILING POINT: 617-691 F

FLASH POINT: 349 F

FLAMMABLE LIMITS: UNKNOWN

ODOR CHARACTERISTICS:

INCOMPATIBILITIES: STRONG OXIDIZERS

BIOLOGICAL PROPERTIES:

IDLH

TLV TWA 1 MG/M3

PEL 1 MG/M3

CLEAR THRESHOLD

HUMAN (LCLO) 10 MG/M3

RAT/MOUSE (LC50)

AQUATIC 278 PPM

CARCINOGEN SUB. HUM

TERATOGEN

MUTAGEN ANIM-POS

ROUTE OF EXPOSURE [X] INHALATION

[X] EYE/CHIA

[X] SKIN CONTACT

[X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

ANY DETECTABLE LIMIT SCBA, EXCEL VITON, GOOD BUTYL, VINYL NITRILE, POOR NEOPRENE, SAFETY GOGGLES, CLOTHING TO AVOID CONTACT

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: IRRITATION OF EYES, NOSE, THROAT, CAN CAUSE VOMITING, EDEMA, ANOREXIA, NAUSEA, ABDOMINAL PAIN, FATIGUE

CHRONIC SYMPTOMS: CHLORACNE FROM PROLONGED SKIN CONTACT, ACUTE & CHRONIC EXPOSURE MAY CAUSE LIVER DAMAGE OR CANCER

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GARGLE WITH WATER AND USE SEDATIVE COUGH MIXTURE

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER

INGESTION: GIVE LARGE QUANTITIES OF SALT WATER, INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: RTECS

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6/07/93

CHEMICAL NAME: Polynuclear Aromatics

CAS NUMBER: Various DOT NAME/ID NO.:

RQ:

SYNONYMS: Anthracene, Chrysene, Pyrene, Indene

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: CxHx MOLECULAR WEIGHT: Var. PHYSICAL STATE: Liquid SPG/D: Var. SOLUBILITY (H2O): insoluble
VAPOR PRESS.: 1-17-1-2 FREEZING POINT: BOILING POINT: Varied FLASH POINT: FLAMMABLE LIMITS: 0-6-2
ODOR CHARACTERISTICS: Varied
INCOMPATIBILITIES: Strong Oxidizers

BIOLOGICAL PROPERTIES:

LD50: 115-175 RAT M-REF (CLASS) FEL: 0-2mg/m3 AQUATIC: 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-1860-1861-1862-1863-1864-1865-1866-1867-1868-1869-1870-1871-1872-1873-1874-1875-1876-1877-1878-1879-1880-1881-1882-1883-1884-1885-1886-1887-1888-1889-1890-1891-1892-1893-1894-1895-1896-1897-1898-1899-1900-1901-1902-1903-1904-1905-1906-1907-1908-1909-1910-1911-1912-1913-1914-1915-1916-1917-1918-1919-1920-1921-1922-1923-1924-1925-1926-1927-1928-1929-1930-1931-1932-1933-1934-1935-1936-1937-1938-1939-1940-1941-1942-1943-1944-1945-1946-1947-1948-1949-1950-1951-1952-1953-1954-1955-1956-1957-1958-1959-1960-1961-1962-1963-1964-1965-1966-1967-1968-1969-1970-1971-1972-1973-1974-1975-1976-1977-1978-1979-1980-1981-1982-1983-1984-1985-1986-1987-1988-1989-1990-1991-1992-1993-1994-1995-1996-1997-1998-1999-2000-2001-2002-2003-2004-2005-2006-2007-2008-2009-2010-2011-2012-2013-2014-2015-2016-2017-2018-2019-2020-2021-2022-2023-2024-2025-2026-2027-2028-2029-2030-2031-2032-2033-2034-2035-2036-2037-2038-2039-2040-2041-2042-2043-2044-2045-2046-2047-2048-2049-2050-2051-2052-2053-2054-2055-2056-2057-2058-2059-2060-2061-2062-2063-2064-2065-2066-2067-2068-2069-2070-2071-2072-2073-2074-2075-2076-2077-2078-2079-2080-2081-2082-2083-2084-2085-2086-2087-2088-2089-2090-2091-2092-2093-2094-2095-2096-2097-2098-2099-2100-2101-2102-2103-2104-2105-2106-2107-2108-2109-2110-2111-2112-2113-2114-2115-2116-2117-2118-2119-2120-2121-2122-2123-2124-2125-2126-2127-2128-2129-2130-2131-2132-2133-2134-2135-2136-2137-2138-2139-2140-2141-2142-2143-2144-2145-2146-2147-2148-2149-2150-2151-2152-2153-2154-2155-2156-2157-2158-2159-2160-2161-2162-2163-2164-2165-2166-2167-2168-2169-2170-2171-2172-2173-2174-2175-2176-2177-2178-2179-2180-2181-2182-2183-2184-2185-2186-2187-2188-2189-2190-2191-2192-2193-2194-2195-2196-2197-2198-2199-2200-2201-2202-2203-2204-2205-2206-2207-2208-2209-2210-2211-2212-2213-2214-2215-2216-2217-2218-2219-2220-2221-2222-2223-2224-2225-2226-2227-2228-2229-2230-2231-2232-2233-2234-2235-2236-2237-2238-2239-2240-2241-2242-2243-2244-2245-2246-2247-2248-2249-2250-2251-2252-2253-2254-2255-2256-2257-2258-2259-2260-2261-2262-2263-2264-2265-2266-2267-2268-2269-2270-2271-2272-2273-2274-2275-2276-2277-2278-2279-2280-2281-2282-2283-2284-2285-2286-2287-2288-2289-2290-2291-2292-2293-2294-2295-2296-2297-2298-2299-2300-2301-2302-2303-2304-2305-2306-2307-2308-2309-2310-2311-2312-2313-2314-2315-2316-2317-2318-2319-2320-2321-2322-2323-2324-2325-2326-2327-2328-2329-2330-2331-2332-2333-2334-2335-2336-2337-2338-2339-2340-2341-2342-2343-2344-2345-2346-2347-2348-2349-2350-2351-2352-2353-2354-2355-2356-2357-2358-2359-2360-2361-2362-2363-2364-2365-2366-2367-2368-2369-2370-2371-2372-2373-2374-2375-2376-2377-2378-2379-2380-2381-2382-2383-2384-2385-2386-2387-2388-2389-2390-2391-2392-2393-2394-2395-2396-2397-2398-2399-2400-2401-2402-2403-2404-2405-2406-2407-2408-2409-2410-2411-2412-2413-2414-2415-2416-2417-2418-2419-2420-2421-2422-2423-2424-2425-2426-2427-2428-2429-2430-2431-2432-2433-2434-2435-2436-2437-2438-2439-2440-2441-2442-2443-2444-2445-2446-2447-2448-2449-2450-2451-2452-2453-2454-2455-2456-2457-2458-2459-2460-2461-2462-2463-2464-2465-2466-2467-2468-2469-2470-2471-2472-2473-2474-2475-2476-2477-2478-2479-2480-2481-2482-2483-2484-2485-2486-2487-2488-2489-2490-2491-2492-2493-2494-2495-2496-2497-2498-2499-2500-2501-2502-2503-2504-2505-2506-2507-2508-2509-2510-2511-2512-2513-2514-2515-2516-2517-2518-2519-2520-2521-2522-2523-2524-2525-2526-2527-2528-2529-2530-2531-2532-2533-2534-2535-2536-2537-2538-2539-2540-2541-2542-2543-2544-2545-2546-2547-2548-2549-2550-2551-2552-2553-2554-2555-2556-2557-2558-2559-2560-2561-2562-2563-2564-2565-2566-2567-2568-2569-2570-2571-2572-2573-2574-2575-2576-2577-2578-2579-2580-2581

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6-09-93

CHEMICAL NAME: TOLUENE

CAS NUMBER: 108-88-3 DOT NAME/ID NO.:

RQ:

SYNONYMS: PHENYL METHANE, METHYL BENZENE

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₆H₅CH₃ MOLECULAR WEIGHT: 92 PHYSICAL STATE: LIQUID SPG/D 0.867 SOLUBILITY (H₂O): SLIGHTLY
VAPOR PRESS: 22 MM FREEZING POINT: -139 F BOILING POINT: 231 F FLASH POINT: 40 F FLAMMABLE LIMITS: 1.27-7%
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: STRONG OXIDIZERS, NITRIC ACID, PEROXIDES

BIOLOGICAL PROPERTIES

WLD 1000 PPM VLD 100 PPM TLV 100 PPM
HUMAN DATA: 100-200 PPM RAT MOUSE (LC50): 1 TO 400 AQUATIC: TLM 96 100 TO 1000 PPM
CARCINOGEN: EXPEL TERAPOGEN: EXP MUTAGEN: EXPEL
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

1000 PPM APR W CHEMICAL CARTRIDGE, 2000 PPM SCBA, EXCEL VITON, GOOD POLYURETHANE, NEOPRENE/STYRENE, POOR NEOPRENE, BUTYL

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: MAY CAUSE IRRITATION OF EYES, RESPIRATORY TRACT AND SKIN. MAY ALSO CAUSE FATIGUE, WEAKNESS, CONFUSION, HEADACHE, DIZZINESS AND DROWSINESS. EXPOSURE TO HIGH CONCENTRATIONS CAN CAUSE UNCONSCIOUSNESS AND DEATH. INHALATION MAY CAUSE DIFFICULTY SEEING IN
ACUTE SYMPTOMS: DIZZINESS, HEADACHE, VOMITING, NAUSEA, DIARRHEA, LIQUID IRRITATES EYES, DRIES SKIN

CHRONIC SYMPTOMS: KIDNEY AND/OR LIVER DAMAGE IF INGESTED, INHALATION MAY CAUSE ANEMIA, BONE MARROW HYPOPLASIA, DERMATITIS WITH SKIN CONTACT

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER
INGESTION: DO NOT INDUCE VOMITING; SEEK MEDICAL ATTENTION IMMEDIATELY

DISPOSAL/WASTE TREATMENT:

CO, CO₂

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH, SITTING

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-29-90

CHEMICAL NAME: XYLENE, ALL ISOMERS

CAS NUMBER: 1030-20-7 DOT NAME/ID NO.: FLAMMABLE

RQ:

SYNONYMS: DIMETHYLBENZENE, XYLOL

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₆H₄(CH₃)₂ MOLECULAR WEIGHT 106.20 PHYSICAL STATE: LIQUID SPEC/D 086 SOLUBILITY (H₂O) INSOLUBLE
VAPOR PRESS: 9 MM FREEZING POINT: BOILING POINT: FLASH POINT 31 F FLAMMABLE LIMITS:
ODOR CHARACTERISTICS: AROMATIC ODOR, SWEET
INCOMPATIBILITIES: STRONG OXIDIZERS

BIOLOGICAL PROPERTIES:

LD ₅₀ 1000 PPM	LD ₅₀ 100 PPM	LD ₅₀ 10 PPM	LD ₅₀ 1 PPM
HUMAN (CLIN)	RAT-MOUSE (CLIN)	AQUATIC	
CAR-IN-SH	FEEDING		WATER EXPOS
ROUTE OF EXPOSURE	(X) INHALATION	(X) EYE CONTACT	(X) SKIN CONTACT (X) INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

APR DUSTY/WINDY CONFIN OR KNOWN HIGH CONCENT OR 1 BUT 500 PPM SCBA, COVERALL PE TYVEK, GLOVES PVA, VII N PVA DEGRADES IN WATER

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS

ACUTE SYMPTOMS: VAPOR CAUSE DIZZINESS, HEADACHE, COUGH, PULMONARY DISTRESS/EDEMA, NAUSEA/VOMITING, ABDOMINAL CRAMPS, NARCOTIC IN HIGH CONCENT, MILD SKIN IRRITANT

CHRONIC SYMPTOMS: POSSIBLE LIVER AND/OR KIDNEY DAMAGE, PULMONARY CONGESTION, INGESTION MAY BE FATAL

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER
INGESTION: DO NOT INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [X] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: RTECS, NIOSH GUIDES, SIGMA-ALDRICH

APPENDIX C

RECOMMENDED LEVEL OF PROTECTION GUIDELINES

LEVELS OF PERSONNEL PROTECTION

LEVEL A

1. MSA 401 self-contained breathing apparatus
2. East Wind CP2000 encapsulating suit
3. White cotton coveralls
4. Cotton underwear
5. Surgical gloves
6. Neoprene boots with steel toe and shank
7. Butyl rubber or PVC booties
8. Disposable gloves* (additional pair)
9. Disposable booties* (additional pair)
10. Hard hat*
11. Cool pack*

LEVEL B

1. MSA 401 self-contained breathing apparatus
2. Butyl rubber apron, ankle length with sleeves
3. Butyl rubber or neoprene gloves
4. Surgical gloves
5. Neoprene boots with steel toe and shank
6. Butyl rubber booties
7. Chemical-resistant coveralls
8. Cotton underwear
9. Disposable booties* (additional pair)
10. Disposable gloves* (additional pair)
11. Hard hat with face shield*

LEVEL C

1. MSA Ultra-Twin cartridge respirator
2. Robertshaw escape mask
3. Butyl rubber gloves
4. Butyl rubber apron, ankle length with sleeves
5. Surgical gloves
6. Neoprene boots with steel toe and shank
7. Butyl rubber booties
8. Chemical-resistant coveralls
9. Cotton underwear
10. Disposable booties* (additional pair)
11. Disposable gloves* (additional pair)
12. Hard hat with face shield*

LEVEL D

1. Cotton coveralls
2. Cotton underwear
3. Safety boots/shoes
4. Safety glasses
5. Hard hat with optional face shield
6. Ultra-Twin cartridge respirator (readily available)
7. Robertshaw escape mask (readily available)
8. Work gloves

NOTE: E & E guidelines may at times exhibit minor modifications to U.S. EPA criteria.

* Optional

APPENDIX D

STATEMENT OF MEDICAL FITNESS

APPENDIX D
STATEMENT OF MEDICAL FITNESS

This is to confirm that the following employees may engage in field activities at >_____ in connection with the Subcontract Agreement between E & E and >_____, dated >_____, 19>____, and that all of said employees are medically fit both to perform required field activities and to utilize respiratory equipment in accordance with 29 CFR, Part 1910 and "U.S. EPA Standard Operating Safety Guides", 1094.

> _____

> _____

> _____

> _____

> _____

Authorized Subcontractor
Representative

APPENDIX E

REPRESENTATIONS AND CERTIFICATIONS REGARDING SUBCONTRACTOR STATUS

REPRESENTATIONS AND
CERTIFICATIONS REGARDING SUBCONTRACTOR STATUS

1. SMALL BUSINESS CERTIFICATION

- A. The offeror/contractor certifies that it is ☐, is not ☐, a small business concern as defined in accordance with Section 3 of the Small Business Act (15 U.S.C. 632).
- B. "Small Business Concern" as used in this offer means a concern, including its affiliates, that is independently owned and operated, is not dominant in the field of operation in which it is bidding on Government contracts, and is qualified as a small business under the criteria and size standards set forth in 13 CFR 121 or FAR Part 19.

2. SMALL DISADVANTAGED BUSINESS CERTIFICATION

The offeror/contractor certifies that it is a small business concern (as set forth in 1. above) and is ☐, is not ☐, owned and controlled by socially and economically disadvantaged individuals.

- A. Socially and economically disadvantaged individuals are defined as:

1. United States citizens who are Black Americans, Hispanic American, Native Americans, (Indian Tribes, Eskimos, Native Hawaiians) Asian-Pacific Americans, Subcontinent Asian Americans, or other specified minorities;
2. Any other individual found to be disadvantaged pursuant to Section 8(a) of the Small Business Act (15 U.S.C. 637); or
3. Any other individual defined as socially, and economically disadvantaged, for purposes relating to other sections of the Small Business Act.

- B. A small disadvantaged business concern is defined as one:

1. Which is at least 51 percent owned by one or more such individuals or, in the case of publicly owned business, at least 51 percent of the stock is owned by individuals defined in A above.
2. Whose management and daily business operations are controlled by one or more such individuals, and
3. Which provides certification concerning said ownership and control.

3. WOMEN-OWNED SMALL BUSINESS CERTIFICATION

The offeror/contractor certifies that it is , is not , a woman-owned small business concern. "Woman-owned" as used in this offer means a small business (defined above) that is at least 51 percent owned, controlled, and operated by a woman or women who are US citizens. "Controlled" is defined as exercising the power to make policy decisions. "Operated" is defined as actively involved in the day-to-day management.

4. LABOR SURPLUS AREA CONCERNS

For the purpose of identifying work which will be performed in labor surplus areas, we stipulate the intended principal source of labor for the work described in this offer is:

Street Address

City County State

5. RURAL AREA SMALL BUSINESS CERTIFICATION

The offeror represents that it is , is not , a rural area small business concern. Rural area small business as used in this provision, means a small business concern that is located and conducts its principal operations in a rural geographic area (county or parish) listed in the Small Business Administration's Listing of Non-Metropolitan Rural Counties by State.

The offeror certifies that the information provided above is true and accurate.

FIRM _____
SIGNATURE _____
TITLE _____
 (Authorized Representative)
DATE _____

APPENDIX F

STATEMENT OF HEALTH AND SAFETY TRAINING

APPENDIX F

STATEMENT OF HEALTH AND SAFETY TRAINING

This is to confirm that the following employees may engage in field activities at >_____ in connection with the scope of work provided by E & E, dated >_____, 19 >__, and that all of said employees are trained in the health and safety aspects addressed in 29 CFR 1910. 120 and other applicable state and federal regulations. This includes an approved 40 hour health and safety training program and any required yearly update training.

<u>NAME OF ON-SITE PERSONNEL</u>	<u>TITLE</u>
> _____	> _____
> _____	> _____
> _____	> _____
> _____	> _____
> _____	> _____

Authorized Subcontractor
Representative

Date

APPENDIX G

REQUIREMENTS FOR INSURANCE COVERAGE

Insurance Requirements

Please provide documentation showing at least:

- \$1,000,000.00 in Pollution Liability and
- \$1,000,000.00 in General Liability.

APPENDIX H

BID SHEETS

**EXHIBIT 2
 BID SHEETS
 FOR EXPLORATORY BORINGS
 AT LEVEL D
 76TH & ALBANY SITE
 CHICAGO, COOK COUNTY, ILLINOIS
 TDD: S05-9611-009**

ITEM	DESCRIPTION	UNIT PRICE	ESTIMATED QUANTITY	TOTAL
1	Prepare and submit site-specific health and safety plan	\$_____	Lump Sum	\$_____
2	Mobilization and demobilization	\$_____	Lump Sum	\$_____
3a	Soil borings without sampling	\$_____/foot	450 feet	\$_____
3b	Soil boring with sampling	\$_____/foot	750 feet	\$_____
4	Delay time (standby)	\$_____/hour	5 hours	\$_____
5	Difficult moving time	\$_____/hour	5 hours	\$_____
6a	Backfilling of boreholes	\$_____/foot	1,200 feet	\$_____
6b	Materials for backfilling boreholes	\$_____/bag	10 bags	\$_____
7	Decontamination	\$_____/hour	20 hours	\$_____
8a	Waste collection/containerization	\$_____/hour	10 hours	\$_____
8b	Waste containers	\$_____/drum	10 drums	\$_____
BID TOTAL				\$_____

 Company Name and Address

 Authorized Representative/Title

 Signature/Date

 Telephone/Fax Number

**EXHIBIT 2
 BID SHEET
 FOR EXPLORATORY BORINGS
 AT LEVEL C
 76TH & ALBANY SITE
 CHICAGO, COOK COUNTY, ILLINOIS
 TDD: S05-9611-009**

ITEM	DESCRIPTION	UNIT PRICE	ESTIMATED QUANTITY	TOTAL
1	Prepare and submit site-specific health and safety plan	\$ _____	Lump Sum	\$ _____
2	Mobilization and demobilization	\$ _____	Lump Sum	\$ _____
3a	Soil borings without sampling	\$ _____ /foot	450 feet	\$ _____
3b	Soil boring with sampling	\$ _____ /foot	750 feet	\$ _____
3c	Upgrade to level "C" protection	\$ _____ /hour	20 hours	\$ _____
4	Delay time (standby)	\$ _____ /hour	5 hours	\$ _____
5	Difficult moving time	\$ _____ /hour	5 hours	\$ _____
6a	Backfilling of boreholes	\$ _____ /foot	1,200 feet	\$ _____
6b	Materials for backfilling boreholes	\$ _____ /bag	10 bags	\$ _____
7	Decontamination	\$ _____ /hour	20 hours	\$ _____
8a	Waste collection/containerization	\$ _____ /hour	10 hours	\$ _____
8b	Waste containers	\$ _____ /drum	10 drums	\$ _____

BID TOTAL \$ _____

 Company Name and Address

 Authorized Representative/Title

 Signature/Date

 Telephone/Fax Number

APPENDIX I

SAMPLE SUBCONTRACT

AGREEMENT

ECOLOGY AND ENVIRONMENT, INC.

AND

TDD No. _____

PAN _____

AGREEMENT, entered into and made effective as of the ____ day of _____
1996, by and between ECOLOGY AND ENVIRONMENT, INC., a New York corporation,
with headquarters at 368 Pleasant View Drive, Lancaster, New York 14086 (hereafter,
"E & E"), and _____, with offices at _____
_____, (hereafter, the "Subcontractor").

W I T N E S S E T H:

WHEREAS, Ecology and Environment, Inc., with headquarters at 368 Pleasant View
Drive, Lancaster, New York 14086, and a business office at 33 North Dearborn Street,
Chicago, Illinois 60602, has entered into a contract (Contract No. 68-W6-0011) with the
United States Environmental Protection Agency (EPA), with an effective date of December
18, 1995, to furnish technical, engineering and managerial services in support of EPA's
Emergency Response, Removal, and Prevention Programs within EPA Region V; and

WHEREAS, E & E, with the approval of the Government, desires to subcontract a
portion of its work to the Subcontractor; and

WHEREAS, the Subcontractor agrees to provide such subcontract services in
accordance with the terms stated herein.

NOW, THEREFORE, in consideration of the mutual covenants, premises, conditions
and terms to be kept and performed, the parties hereto agree as follows:

GENERAL TERMS

1. EMPLOYMENT

E & E hereby agrees to engage the Subcontractor, and the Subcontractor hereby agrees to perform the services as provided for herein, and as set forth in Exhibit 1, annexed hereto and made a part hereof, in connection with the program and the Contract.

2. SCOPE OF WORK

The services to be provided by the Subcontractor for and on behalf of E & E shall be those specified in Exhibit 1, annexed hereto and made a part hereof. All services are for the purpose of supporting and assisting E & E in furnishing technical and managerial services to the EPA under the Contract. The Subcontractor shall furnish the necessary personnel, material, and service facilities (except as may be otherwise specified herein), and shall otherwise do all things necessary for or incident to the performance of the work specified in Exhibit 1, and any references contained therein.

3. CONTRACT DOCUMENTS AND ORDER OF PREFERENCE

A. This agreement consists of the following documents:

- (1) This Subcontract Agreement dated as of the effective date written above, with attached Exhibits.
- (2) The additional general provisions required by the prime Contract, which are hereby incorporated by reference as follows:

<u>FAR Clause Number</u>	<u>Clause Title and Application</u>
52.202-01	DEFINITIONS
52.203-01	OFFICIALS NOT TO BENEFIT
52.203-03	GRATUITIES
52.203-05	COVENANT AGAINST CONTINGENT FEES
52.203-06	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT

<u>FAR Clause Number</u>	<u>Clause Title and Application</u>
52.203-07	ANTI-KICKBACK PROCEDURES (If over \$100,000)
52.209-06	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED OR PROPOSED FOR DEBARMENT
52.215-01	EXAMINATION OF RECORDS BY COMPTROLLER GENERAL (Negotiated Contracts over \$10,000)
52.215-02	AUDIT -- NEGOTIATION (Negotiated Contracts over \$25,000)
52.215-22	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (Negotiated Contracts over \$25,000)
52.215-24	SUBCONTRACTOR COST OR PRICING DATA (Negotiated Contracts over \$100,000)
52.215-26	INTEGRITY OF UNIT PRICES (If over \$25,000)
52.215-33	ORDER OF PRECEDENCE
52.216-07	ALLOWABLE COST AND PAYMENT (If over \$25,000)
52.219-08	UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS
52.219-9	SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN
52.219-13	UTILIZATION OF WOMEN OWNED SMALL BUSINESSES
52.219-16	LIQUIDATED DAMAGES - SMALL BUSINESS SUBCONTRACTING PLAN
52.220-03	UTILIZATION OF LABOR SURPLUS AREA CONCERNS
52.222-03	CONVICT LABOR
52.222-26	EQUAL OPPORTUNITY
52.222-35	AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS (If over \$10,000)

<u>FAR Clause Number</u>	<u>Clause Title and Application</u>
52.222-36	AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (If over \$2,500)
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA
52.223-02	CLEAN AIR AND WATER (If over \$100,000)
52.223-03	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA
52.223-06	DRUG-FREE WORKPLACE
52.227-1	AUTHORIZATION AND CONSENT
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
52.227-17	RIGHTS IN DATA - SPECIAL WORKS
52.230-02	COST ACCOUNTING STANDARDS (Negotiated Contracts over \$100,000)
52.230-3	DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES
52.230-5	ADMINISTRATION OF COST ACCOUNTING STANDARDS
52.233-1	DISPUTES ALTERNATE 1
52.233-03	PROTEST AFTER AWARD ALTERNATE 1
52.242-13	BANKRUPTCY
52.243-03	CHANGES - TIME AND MATERIALS
52.244-03	SUBCONTRACTS
52.245-05	GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME AND MATERIAL, OR LABOR-HOUR CONTRACTS)
52.246-06	INSPECTION
52.246-25	LIMITATION OF LIABILITY--SERVICES (If over \$25,000)

FAR Clause Number	Clause Title and Application
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52.249-6	TERMINATION
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52.249-14	EXCUSABLE DELAYS
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EPAAR Clause Number	Clause Title
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1552.235-70	SCREENING OF BUSINESS INFORMATION FOR CLAIMS OF CONFIDENTIALITY
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1552.235-71	TREATMENT OF CONFIDENTIAL BUSINESS INFORMATION
-------------	--

(3) Any special E & E "Terms and Conditions", to the extent such Terms are applicable, are identified as such, and are attached hereto.

B. In the general provisions listed above all references to the Contractor or E & E shall be deemed references to the subcontractor, and all references to the EPA or the Government shall be deemed reference to E & E.

C. In the event of any inconsistency in this Subcontract, the inconsistencies shall be resolved by giving precedence in the following order:

- (1) This Subcontract Agreement with attached Exhibits
- (2) The Additional provisions, approved protocols and procedures incorporated into this Subcontract by reference
- (3) The General Provisions of the Contract

4. PERIOD OF PERFORMANCE

The period of performance of this Subcontract shall be for a term of ____ days from the notice to proceed.

5. ESTIMATED COST

The total cost of this Subcontract is firm fixed unit price not to exceed \$_____ and 00/100 dollars (\$_____). No payments shall be made to the Subcontractor other than against a properly prepared and submitted invoice in accordance with Article 8 of this Subcontract.

6. PAYMENT FOR SERVICES

E & E shall pay the Subcontractor for the services performed in accordance with the Subcontractor's price schedule, annexed hereto as Exhibit 2 and made a part hereof, and in accordance with the provisions of this Subcontract. No invoice for such services shall include work in excess of forty (40) hours in any week, except as authorized in advance by the Regional START Program Manager, or such other E & E employee(s) designated in writing by the Program Manager. Invoices shall be supported by documents, time sheets, itemized lists of material, or other documents as may be reasonably required by E & E and EPA. Notwithstanding anything in this Subcontract to the contrary, the Subcontractor shall be paid for services performed on behalf of E & E pursuant to this Subcontract within forty-five (45) days of receipt of a valid invoice by E & E for such services.

7. SUBCONTRACTOR ACCOUNTING SYSTEM

The Subcontractor shall employ an accounting system for this agreement to identify and record site specific costs on a site specific activity basis. Site specific cost documentation must be readily retrievable and sufficiently identifiable to enable cross referencing with payment vouchers for purposes of cost recovery litigations.

8. SUBMISSION OF CLAIMS FOR REIMBURSEMENT

In accordance with the provisions of this Subcontract, and the cost proposal/schedule at Exhibit 2 incorporated into and made a part hereof, each Subcontractor invoice or claim for reimbursement, along with any required supporting statements or certificates, shall be processed in accordance with the instructions entitled "Guide for the Preparation of Contractor's Claim for Reimbursement of Costs and Fees Under Cost Reimbursement Type Contracts", EPA Form 1900-34, which is incorporated herein by reference and made a part hereof. Subcontractor invoices and claims shall be submitted to the address designated below:

Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086

Attention: Accounts Payable

for subsequent submission to EPA. E & E agrees to submit such claims promptly upon receipt thereof.

9. TECHNICAL DIRECTION

The Subcontractor shall promptly perform all work directed by the E & E Regional START Subcontracts Manager or his designated representative (Subcontract Technical/Project Officer) in accordance with the technical direction given by them which may include, but need not be limited to:

- (1) the anticipated level of effort to be devoted to each task;
- (2) the anticipated end product(s) of each task; and
- (3) the completion date for each task.

All work so performed shall remain subject to the "Limitation of Cost" and "Limitation of Funds" provisions of this Subcontract, as well as the "Level of Effort" provisions of this Subcontract to the extent they are incorporated into and made a part hereof.

10. E & E REGIONAL START SUBCONTRACTS MANAGER MODIFICATION OF SUBCONTRACT

Notwithstanding any of the provisions of this Subcontract, only the E & E Regional START Subcontracts Manager is authorized to alter the scope of work set forth in Exhibit 1 of this Subcontract, or to amend or modify in any way any of the terms of the Subcontract.

11. AMENDMENTS IN WRITING

This Subcontract may be amended only by a further written agreement, duly executed, between the parties, and such amendment shall be subject to the prior approval of the Government. This Subcontract may not be changed orally.

12. NOTIFICATION OF CHANGES TO SUBCONTRACT

A. Definitions

As used in this Article, the term "E & E Regional START Subcontracts Manager" does not include any representative of the E & E Regional START Subcontracts Manager, whether or not such representative is acting within the scope of his authority.

B. Notice

The primary purpose of this Article is to obtain prompt reporting by the Subcontractor of Government or Contractor conduct which the Subcontractor considers to constitute a change to this Subcontract. Except for changes identified as such, the Subcontractor shall notify the E & E Regional START Subcontracts Manager promptly in writing, and in any event within ten (10) calendar days from the date the Subcontractor so identifies any Government or Contractor conduct (including actions, inactions, and written or oral communications) that the Subcontractor regards as a change to the Subcontract terms and conditions. The notice shall state, on the basis of the most accurate information available to the Subcontractor, the following:

- (1) the date, nature and circumstance of the conduct regarded as a change;
- (2) the name, function, and activity of each Government individual, Contractor, and Subcontractor official or employee, involved in or knowledgeable of such conduct;
- (3) the identification of any document(s) and the substance of any oral communication involved in such conduct; and
- (4) the particular elements of contract performance for which the Subcontractor may seek an equitable adjustment under the "Changes" clause, including:
 - (a) those portions of the Subcontract statement of work the Subcontractor believes will be affected by the alleged change;
 - (b) the estimated adjustment to the Subcontract with respect to estimated cost and/or fixed fee, delivery or performance schedule; and other provisions affected by the alleged change.

C. Continued Performance

The Subcontractor shall not proceed with the alleged changes as identified in the notice required by B. above, unless notified in advance in writing by the E & E Region V START Subcontracts Manager, in accordance with D (1), below. Until such notification is received,

the Subcontractor shall continue performance of this Subcontract in accordance with its terms and conditions.

D. E & E Response

The E & E Regional START Subcontracts Manager shall respond in writing to the notice required by B. above. In such response, the E & E Region V START Subcontracts Manager shall either:

- (1) confirm that the conduct of which the Subcontractor gave notice does constitute a change, and, when necessary, direct the mode of further performance in accordance with the "Changes" clause;
- (2) countermand any communication regarded as a change;
- (3) deny that the conduct of which the Subcontractor gave notice does constitute a change, and, when necessary, direct the mode of further performance; or
- (4) in the event the Subcontractor's notice information is deemed inadequate to enable the making of a response as set forth in (1), (2) or (3) above, advise the Subcontractor when additional information is required and establish the date by which such additional information is to be furnished.

E. Equitable Adjustments

If the E & E Regional START Subcontracts Manager confirms that E & E or Government conduct effected a change within the scope of the "Changes" clause, as alleged by the Subcontractor, and such conduct causes an increase or decrease in the estimated cost of, or the time required for the performance of, any part of the work under this Subcontract, whether changed or not changed by such conduct, an equitable adjustment may be made in accordance with the "Changes" clause of this Subcontract.

13. NOTICES

All notices and other communications required to be given under this Subcontract, and in the absence of specific direction otherwise, shall be deemed effectively made or given if written and delivered to the appropriate party at the address listed below, or at such other address or addresses as either party may, from time to time designate in writing:

With respect to E & E:

Ecology and Environment, Inc.
33 North Dearborn Street
Chicago, Illinois 60602

Attention: Mr. Thomas A. Kouris, Region V Start Leader

With respect to the Subcontractor:

Attention: _____

14. COMPLIANCE WITH LAWS

Subcontractor shall comply with all applicable state, federal, and local laws and executive orders and regulations in the performance of its services hereunder.

15. HEALTH AND SAFETY

A. General. Subcontractor acknowledges that it has a primary duty to prevent on the job accidents and to protect the health and safety of its employees. Subcontractor understands and acknowledges that this Subcontract will entail work at sites that pose potential exposure to hazardous materials and that such work is inherently dangerous. Subcontractor also understands that accidents, bodily injury, or property damage could result from human errors in judgement, mistakes, carelessness, forgetfulness, sloppiness, and work performed in haste. It is the duty and responsibility of the Subcontractor to train and supervise all its personnel and activities to prevent such occurrences. Subcontractor represents that it has the requisite corporate resources and expertise to perform the services hereunder.

B. Requirements. At a minimum, Subcontractor shall in all cases strictly comply with all relevant or applicable Federal, State, and local legal regulatory requirements, guidelines, and generally accepted procedures and standards of practices governing the physical and chemical hazards associated with the provision of said services, including the appropriate requirements set forth in 29 CFR Parts 1910 and 1926, including in particular, the provisions of 29 CFR 1910.120; 1910.132; 1910.133; and 1910.134. Subcontractor will also comply with any special requirements necessary to accommodate specific site conditions.

C. Site Health and Safety Plans. Subcontractor shall determine the necessary methods and means to accomplish the purposes of this Agreement and take all necessary measures to ensure that said purposes are achieved safely under its direction. Subcontractor agrees to submit to E & E its health and safety plan relating to site activities prior to commencement of work. Subcontractor further acknowledges that E & E bears no duty or legal responsibility to supervise Subcontractor personnel. Any advice or direction provided by E & E or the client

shall not relieve Subcontractor or any of its employees of any obligations hereunder, unless such advice and direction is provided in writing to the Subcontractor, in accordance with paragraph 13 hereunder.

D. Procedures. Subcontractor agrees at a minimum to abide by all EPA safety and health programs and procedures while performing any on-site services in connection with this Agreement. Subcontractor further agrees to adhere to its Health and Safety Plan for site activities and understands and agrees that failure to do so may result in the shutdown of Subcontractor activities by E & E or the EPA and concurrently, the assumption by Subcontractor of legal responsibility for additional costs and damages pursuant to paragraph 33 of this Agreement. The Subcontractor further agrees to require any of its employees who are engaged in field work hereunder to submit to physical examinations and/or to comply with any health and/or medical program for preventative or remedial or other purposes, if and when required by the EPA.

E. Medical Surveillance Program. Each Subcontractor employee involved in field activities under this agreement should be enrolled in a medical surveillance program. The Subcontractor acknowledges that it is its sole responsibility to institute a medical surveillance program as required by 29 CFR 1910, including but not limited to 29 CFR 1910.120(f), and that the instituting of any such program shall be solely at its own expense. The Subcontractor agrees to submit to E & E a certification that each employee assigned to field operations on this project, is enrolled in a medical surveillance program, and has been medically certified by a physician for this work, including the use of a respirator. Certifications of employee medical status must be submitted to E & E before any employee shall be permitted to enter a hazardous waste site under this agreement. (See Appendix A to Exhibit 1.)

F. Hazardous Waste Operations Training Program. The Subcontractor shall arrange for and require that all of its employees who will be working on a hazardous waste site take a safety and health training course with annual refreshers which conform to the requirements specified in OSHA Regulations 29 CFR 1910.120(e). Certification of completion of such courses by each employee who is to work on site under this agreement shall be furnished to Ecology and Environment, Inc. prior to any such employee's entering the site for any purpose. (See Appendix B to Exhibit 1).

G. First Aid Training and CPR Training. The Subcontractor agrees that its employees will not enter any site under this agreement, unless a minimum of two field personnel are present on the site that are currently certified by the American Red Cross in both Multimedia First Aid and Cardiopulmonary Resuscitation (CPR)-Modular, or equivalent. These trained individuals need not be subcontractor employees.

H. Use of Equipment and Protective Clothing at Hazardous Waste Sites. The Subcontractor agrees that each employee shall wear such protective clothing and use such equipment as specified in the site Health and Safety Plan at all times when such employee is on the site. The Subcontractor hereby agrees to comply with the requirements set forth at 29 CFR 1910.134 including those provisions that require facial hair to be removed and/or special facepiece lenses to be utilized by persons with poor eyesight in the event respiratory equipment is to be used.

16. EQUAL EMPLOYMENT OPPORTUNITY

The provisions of the clause contained in FAR Subpart 22.8 in effect on the date hereof are hereby incorporated herein by reference with the following change: The word "Contractor" shall mean "Subcontractor."

17. PROHIBITION AGAINST ASSIGNMENT -- SUBCONTRACTING

It is understood and agreed that the Subcontractor shall be an independent contractor and that the Subcontractor shall not further subcontract out any of the work to be performed by it under this subcontract nor assign said Subcontract without, in each case, the prior written consent of E & E and of the Government, if appropriate.

18. INCREMENTAL FUNDING

It is understood that EPA Contract 68-W6-0010 is being incrementally funded. It is, therefore, understood that this Subcontract is funded only to the extent funds are available to pay for the Subcontractor's services in accordance with the Contract, and that the Subcontractor will be paid only to the extent funds are available for allocation to the Subcontractor under the Contract. E & E shall notify the Subcontractor thirty (30) days in advance of any period for which Contract No. 68-W6-0010 with the Government has not been funded.

19. CONSULTANT SERVICE

The Subcontractor agrees to determine and notify E & E whether or not it or any consultant to be utilized by it under this Subcontract has in effect an agreement with the Federal Government for similar services, and if so, will advise the E & E Regional START Subcontracts Manager accordingly.

20. FUTURE EXPERT CONSULTING SERVICES

It is recognized that, subsequent to performance under this subcontract, the need may arise to provide expert testimony during hearings, and/or court proceedings involving site specific activities or other matters, with regard to which personnel provided by the subcontractor under this contract would have gained expertise as a result of tasks performed under this contract. Therefore, the subcontractor agrees to make available expert consulting services in support of such future proceedings, and to enter into intent agreements as necessary with lower tier subcontractors (if any) to ensure the availability of such subcontractor personnel. Agreement to provide such services in the future serves as a notice of intent only. Such services are not purchased hereby, and will be obtained, as required, through a separate contractual agreement.

21. DESIGNATION OF PATENT ADVISOR

The Patent Advisor Office of General Counsel, EPA, Washington, D.C. 20460, is hereby designated to represent E & E in administering the "Patents and Inventions" clause in this Subcontract. Correspondence with respect to this clause should be directed to the Patent Advisor, with a copy to the EPA's Contracting Officer, and copy to the E & E Regional START Subcontracts Manager. The requirements of the "Patents and Inventions" clause regarding the identification and mailing address of the Contracting Officer in this Subcontract may be satisfied by including this entire paragraph.

22. FEDERAL REPORTS ACT

In the event that it subsequently becomes a requirement of this Subcontract to collect identical information from ten (10) or more public respondents, the Federal Reports Act, 44 USC 3501, et seq., shall apply to this Subcontract. In such event, the Subcontractor shall not expend any funds to, or take any other action whatsoever, to solicit information from any of the public respondents until the EPA Contracting Officer has notified E & E in writing that the required Office of Management and Finance final clearance has been obtained, and E & E

has so notified the Subcontractor. The Subcontractor shall provide to the EPA Contracting Officer, or the E & E Regional START Subcontracts Manager, such information as will facilitate obtaining such clearance.

23. SUBCONTRACT CONSENT

This Subcontract, and all amendments thereto, are subject to the prior approval of the EPA Contracting Officer, as provided for in the clause of the General Provisions entitled, "Subcontracts".

24. ORGANIZATIONAL CONFLICT OF INTEREST

A. The Subcontractor warrants that, to the best of its knowledge and belief, and except as otherwise set forth in this Subcontract, it does not have any organizational conflict of interest as defined in Paragraph B, below.

B. The term "Organizational Conflict of Interest" means a relationship exists whereby the Subcontractor (including its chief executives, directors, and proposed consultants) has interests which:

- (1) may diminish its capacity to give impartial, technically sound, and objective advice and assistance, or may otherwise result in a biased work product; or
- (2) may result in an unfair competitive advantage. Such interests include, but are not limited to, present or proposed contractual arrangements with an industry to be studied, present or proposed contractual agreements with a firm which manufactures or sells any substance or item to be studied, present or proposed manufacture or sale of any substance or item to be studied, and present or proposed manufacture or sale of any substance or item in competition with a substance or item to be studied under the proposed Subcontract. It is not relevant that the Subcontractor has either the reputation of being able to resist the temptation to give biased advice or the ability to resist such temptation.

C. The Subcontractor agrees that, if after the effective date of this Subcontract, it discovers an organizational conflict of interest with respect to this Subcontract, it shall make an immediate and full disclosure in writing to the EPA Contracting Officer and the E & E Regional START Subcontracts Manager, which disclosure shall include a description of the action which the Subcontractor has taken, or proposes to take, to avoid, eliminate or neutralize the conflict. E & E may, however, terminate this Subcontract at its convenience in

the event of any organizational conflict of interest if such termination would be in the best interests of itself or EPA, or if termination is required by EPA.

D. The Subcontractor agrees further that if a conflict of interest were identified prior to the execution of this Subcontract, it will adequately avoid, eliminate or neutralize the conflict in a manner satisfactory to the E & E Regional START Subcontracts Manager and the EPA Contracting Officer.

E. In the event the Subcontractor was aware of an organizational conflict of interest any time prior to or after the execution to this Subcontract, and intentionally did not disclose the conflict to E & E or the EPA Contracting Officer, E & E may terminate the Subcontract for default, and E & E and/or the Government may invoke such other remedies as may be authorized by law.

25. CONFLICTS OF INTEREST REGARDING PERSONNEL

In addition to the requirements of Paragraph 24 Organizational Conflict of Interest, the following provision with regards to employee personnel performing under this subcontract shall apply.

The subcontractor agrees to immediately notify E & E's Regional START Subcontracts Manager of any actual, apparent, or potential personal conflicts of interest with regards to any subcontractor employee, or consultant working on or having access to information regarding this subcontract. A personal conflict of interest is defined as a relationship of an employee, or consultant with an entity that may impair the objectivity of the employee or consultant in performing the subcontract work. The subcontractor agrees to notify E & E's Regional START Subcontract Manager prior to incurring costs for that employee's work where an employee may have a personal conflict of interest. In the event that the personal conflict of interest does not become known until after performance of the subcontract has begun, the Contractor shall immediately notify E & E's Regional START Subcontract Manager of the personal conflict of interest. The Subcontractor shall continue performance of this contract until notified by E & E's Regional START Subcontract Manager of the appropriate action to be taken.

This paragraph shall apply to any subcontract or consultant agreement placed hereunder, except for subcontracts or consultant agreements for such services as well drilling, fence erecting, plumbing, utility hookups, security, electrical, or other similar services.

provisions which shall conform substantially to the language of this paragraph, unless otherwise authorized by E & E's Regional START Subcontract Manager.

26. PROJECT EMPLOYEE CONFIDENTIALITY AGREEMENT

The subcontractor agrees to obtain confidentiality agreements from all personnel working on requirements under this contract. Such agreements shall contain provisions which stipulate that each individual agrees not to disclose either in whole or in part to any entity external to EPA, DOJ, or the contractor, any technical data provided by the Government or generated by the contractor, any site specific cost information, or any enforcement strategy without first obtaining the written permission of E & E. Such agreements shall be effective for the period of performance of E & E's prime contract and for a period of two years after the expiration of this contract, including any amendments to extend the term of this contract.

27. INSPECTION AND ACCEPTANCE

The E & E Regional START Subcontracts Manager, or his duly authorized or designated representative, is authorized to perform inspection for acceptance and to accept materials and services to be provided.

28. F.O.B. POINT

All items and materials required hereunder shall be delivered F.O.B. Destination (e.g., Job Site), with all shipping and transportation costs prepaid.

29. TOOLS AND MATERIALS

Tools and materials necessary for Subcontractor's performance shall be supplied by Subcontractor. Any tools or materials supplied by E & E, or created from performance of the Agreement, shall remain the property of E & E, and will be returned on demand.

30. WORKING FILES

The Subcontractor shall maintain accurate working files containing all work documentation including calculations, assumptions, interpretations of regulations, source of information, and other raw data required in the performance of this agreement. The Subcontractor shall provide the information contained in its working files to Ecology and Environment, Inc. upon request.

31. TECHNICAL DATA

The Subcontractor hereby agrees to deliver to the E & E Subcontracts Manager within thirty (30) days after being requested to do so by E & E, the following documents:

A. All originals and copies, and all abstracts and excerpts therefrom, of all information supplied to the Subcontractor by Ecology and Environment, Inc. and specifically designated "Confidential Business Information," pursuant to the article entitled "Treatment of Confidential Business Information."

B. All originals and copies, and all abstracts and excerpts therefrom, all information collected by the Subcontractor directly from a business or from a source that represents a business or businesses, such as a trade association, pursuant to the Article entitled "Screening of Business Information for Claims of Confidentiality."

C. All originals (if originals are unavailable, copies will be acceptable) of all Technical Data* which is pertinent to the support of the Remedial Response Program and has been furnished to the Subcontractor by Ecology and Environment, Inc. or has been generated by the Subcontractor in performance of this agreement. In the event that there is any disagreement as to whether certain data is considered pertinent, the Program Manager shall make the final determination. This determination shall not be subject to the terms of the Article entitled "Disputes."

*"Technical Data" as used herein means recorded information, regardless of form or characteristic, of a scientific or technical nature. It may document research, experimental, developmental, or engineering work; or be usable or used to define a process or to procure, produce, support, maintain, or operate material. This data may be graphic or pictorial delineations in media such as drawings or photographs; text in specifications or related performance or design type documents; in machine forms such as punched cards, magnetic tape, computer disks or printouts of data retained in computer memory. Examples of technical data include research and engineering data, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information.

D. Copies of all other types of additional data, including but not limited to: reference materials, source lists, field notes, log books, chemical data, maps, and photographs pursuant to the clause "Rights in Data--Special Works (EPAAR 1552.227-72).

E. Upon receipt of all data provided to Ecology and Environment, Inc. by the Subcontractor under this paragraph, E & E Regional START Subcontracts Manager shall acknowledge in writing to the Subcontractor the receipt of all confidential or other data.

32. TERMINATION BY E & E

Notwithstanding anything in this Subcontract to the contrary, this Subcontract may be terminated by E & E at any time, upon termination of the Contract, and the Subcontractor shall have no claim against E & E, except for services performed prior to the date of termination, and then only to the extent E & E has received payment from the Government for the services performed.

33. REMEDY IN THE EVENT OF BREACH BY THE SUBCONTRACTOR

A. In the event of any breach or failure by the Subcontractor to perform under this Agreement, E & E shall be entitled to avail itself of any and all of the following remedies:

- (1) E & E may reject equipment, material and/or services provided by the Subcontractor which are not in conformance with the contract requirements;
- (2) E & E may suspend or stop performance of any and all site services under this agreement;
- (3) E & E, at its discretion, may complete the work or retain the services of a third-party to complete the work and recover from the Subcontractor any increased costs or deduct such increased costs from any amounts due the Subcontractor under this Subcontract.
- (4) E & E may terminate this Subcontract Agreement for default;
- (5) E & E may require the Subcontractor to remedy by correction or replacement, without cost to E & E, any breach of or failure to comply with the requirements of this Subcontract Agreement;
- (6) E & E may recover any and all damages suffered by E & E as a result of the Subcontractor's breach of or failure to perform in accordance with the terms of this Agreement, which are not subject to the liquidated damages provision set forth above in subparagraph 7 (vi) above. It is acknowledge that such damages include, but are not limited to, additional costs incurred

to complete the work; fees or payments to which E & E otherwise would be entitled that are withheld by Client; and increased professional and legal expenses.

- (7) E & E may withhold and apply any funds due the Subcontractor for any work performed under this Agreement or under any other Contract or Subcontract between E & E and Subcontractor to reimburse E & E for any amounts that it is entitled to recover under this paragraph 7(A), to offset increased costs to be incurred as a result of such breach, or to satisfy any existing or future liability on the part of the Subcontractor which arises or may arise from such breach.

B. The foregoing remedies apply in the same manner and to the same extent to corrected or replacement materials or services, as to materials and services originally delivered or required to be delivered under this Agreement.

C. The failure of E & E to insist, in one or more instances, upon the performance of any term of this contract is not a waiver of E & E's right to future performance of such term, and the Subcontractor's obligation for future performance of such term shall continue in effect.

D. The right and remedies of E & E in this paragraph are in addition to any other rights and remedies provided by law or under this contract.

34. NO WAIVER

No waiver by either party in any default by the other party in the performance of any provision of this Subcontract shall operate as or be construed as a waiver of any future default whether like or different in character.

35. INSURANCE COVERAGE TO BE FURNISHED BY SUBCONTRACTOR

The Subcontractor shall maintain, at its own expense, such insurance as is required by law or regulation, and at a minimum the types and amounts of insurance set forth in that clause of the General Conditions entitled, "Insurance", at the Subcontractor's sole expense, as follows:

A. The Subcontractor shall procure and maintain such insurance as is required by law or regulation, including that required by Subpart 28.3 of the Federal Acquisition Regulations

(FAR) as of the date of execution of this Subcontract, and such insurance as the Contracting Officer prescribes by written direction.

B. At a minimum, the Subcontractor shall procure and maintain the following types and amounts of insurance:

- (1) Workmen's compensation and occupational disease insurance in amounts sufficient to satisfy State law;
- (2) Employer's liability insurance, in the minimum amount of \$100,000 per occurrence;
- (3) Comprehensive general liability insurance for bodily injury, death, or loss of or damage to property of third persons, in the amount of \$1,000,000 per occurrence;
- (4) Pollution liability insurance in the amount of \$1,000,000 per occurrence.
- (5) When aircraft or vessels are used in the performance of this subcontract, public and passenger liability insurance, collision liability, and protection and indemnity liability insurance, in such form, in such amounts, and for such periods of time as E & E may require or approve.

C. With respect to any insurance policy, all or part of the premiums of which the Subcontractor proposes to treat as a direct cost under this Subcontract, and with respect to any proposed qualified program of self-insurance, the approval of the Contracting Officer shall be obtained prior to any claim for payment therefor. The Subcontractor shall be reimbursed for the portion allocable to this Subcontract.

D. The Subcontractor hereby agrees to indemnify, defend and hold harmless E & E, its directors, officers, agents and employees against any and all claims, loss, damage, injury, statutory or regulatory violation, liability to or death of any person, including any employee of E & E, Client or Subcontractor, or for loss of or damage to the property, including claims thereof and reasonable attorneys fees arising therefrom, arising out of or related to the acts, errors or omissions of Subcontractor in performing pursuant to this Agreement.

36. STANDARDS

All services hereunder shall be performed by employees or agents of Subcontractor who are experienced and highly skilled in their profession, and in accordance with the highest standards of workmanship in their professions.

37. DISPUTES

Should any dispute arise between E & E and the Subcontractor or between E & E and the Government concerning the work performed by the Subcontractor under this Subcontract, the Subcontractor agrees to be bound by the decision of the Contracting Officer, and any appeals therefrom, to the same extent E & E is bound. The Subcontractor agrees to pay the cost of the prosecution or the processing of any dispute between E & E and the Government concerning work performed by the subcontractor, and including but not limited to administrative and legal expenses incurred by E & E in prosecuting any such claim on behalf of the Subcontractor.

The Subcontractor also agrees to pay the cost of any appeal, taken at the discretion of the Subcontractor, from the Contracting Officer's decision concerning work performed by the Subcontractor.

38. DESIGNATION OF PROPERTY ADMINISTRATOR

The Contract Property Administrator, DCMAO, 615 Erie Blvd. West, Syracuse, New York 13204-2408, is hereby designated the property administration function for this Subcontract. The Subcontractor agrees to furnish information regarding Government property to the Contract Property Administrator in the manner and to the extent required by the Contract Property Administrator or his duly designated successors, or by the E & E Regional START Subcontracts Manager.

39. ENTIRE AGREEMENT

This Subcontract, with all Exhibits and materials incorporated herein by reference and made part hereof, shall constitute the entire understanding between the parties and no conversations, memoranda, or other matters, whether written or oral, and previously exchanged between the parties hereto, shall alter the terms of this Subcontract.

40. GOVERNING LAW

The parties hereby agree that this Subcontract, including its validity and interpretation, shall in all respects be governed by the laws of the State of New York.

41. JURISDICTION

This Subcontract shall be deemed to be executed in and performed in the County of Erie, of the State of New York, and any action brought pursuant to this Subcontract may be brought only in the Supreme Court of the State of New York, County of Erie.

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement as of the day and year first above written.

AGREED TO AND ACCEPTED:

ECOLOGY AND ENVIRONMENT, INC.

By _____
(Signature)

By _____
(Signature)

(Printed or Typed Name)

Thomas A. Kouris

(Title)

Region V START Leader

EXHIBIT 1
STATEMENT OF WORK

EXHIBIT 2
COST/PRICE DATA

SUBCONTRACTOR'S COST RELEASE

Instructions

SUBCONTRACTOR: Submit original and 2 copies. Sign original and conform signature on copies.

Pursuant to the terms and conditions of this subcontract dated , 1996 and in consideration of the sum of _____
(Total of Cost Paid and Payable)

Dollars (\$_____) which has been or is due to be paid under the said subcontract to _____
(Subcontractor's Name and Address)

herein called the subcontractor to its assignees, if any, does release, and discharge Ecology and Environment, Inc. of all liabilities related to costs incurred by the subcontractor under the said subcontract during the period _____ except for:

1. Specified claims in stated amounts or in estimated amounts where the amounts are not susceptible of exact statement, as follows: (If none so state) _____

2. Claims, together with reasonable expenses incidental thereto, based upon the liabilities of the Subcontractor to third parties arising out of the performance of the said subcontract, which are not known to the Subcontractor on the date of the execution of this release.

IN WITNESS WHEREOF, this release has been executed this _____ day of _____ 1996.

(SUBCONTRACTOR OR CORPORATE NAME)

BY: _____

(TITLE)

EXHIBIT 3

INSURANCE REQUIREMENTS

It is expressly understood and agreed that before work is actually commenced. Subcontractor and Sub-subcontractor, if any, unless expressly relieved of the insurance requirements specified below in writing by E & E shall subscribe for and maintain in full force and effect during the progress of the work, the following minimum insurance coverage:

- A. Workmen's Compensation and Employer's Liability insurance coverage in amounts sufficient to satisfy state law.
- B. Comprehensive General Liability insurance covering bodily injury in an amount of no less than \$1,000,000 per occurrence.
- C. Comprehensive General Liability insurance covering broad form property damage in an amount of not less than \$1,000,000 per occurrence.
- D. Comprehensive Automobile Liability insurance extending to owned and non-owned and hired automobiles in an amount of not less than \$1,000,000 per occurrence.
- E. When aircraft are used in the performance of Agreement, Aircraft Public and Passenger Liability insurance extending to owned and non-owned and hired aircraft in an amount not less than \$1 million per occurrence.
- F. Pollution liability insurance in the amount of \$5,000,000 per occurrence.

Note: These certificates, with the exception of Workmen's Compensation and Employer's Liability, shall specify Ecology and Environment, Inc., as additional insured and all shall require thirty (30) days prior notice of cancellation of coverage to E & E. Notice to E & E and E & E's written approval shall similarly be required where insurance coverages are decreased or other material change in coverage occurs.

Certificates shall be forwarded to:

Denise L. Goulding
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086

Attachment B

Draft Quality Assurance Sampling Plan

Sampling QA/QC Work Plan
76th & Albany

Prepared by
Ecology And Environment

EPA Project No.:
Contractor Work Order No.: 6F2401SI
EPA Contract No.: S05-9602-024

Approvals

Ecology And Environment

EPA

Steve Skare Date
Task Leader

Brad Benning Date
On-Scene Coordinator

Tom Kouris Date
Project Manager

1.0 BACKGROUND

The [suspected] contamination is a result of:

Illegal dumping

The following information is known about the site:

The site is located in the city of Chicago in the county of Cook in the state of Illinois. The location of residents and other significant environments is unknown. It is a site on an unknown number of acres which has been operating for an unknown period of time.

The types of material(s) handled at this site are:

PCBs
volatile compounds

The volume(s) of contaminated materials to be addressed are yet to be determined.

The contaminants of concern are:

Lead, PCBs, and RICLA

The basis of this information may be found in:

Ecology & Environment Site Assessment

2.0 DATA USE OBJECTIVES

The objective of this project/sampling event is to determine:

the extent of contamination

For the purpose of:

Site characterization
Disposal

The data will be evaluated against:

Federal/State Action Levels

The hazardous waste criteria of the Resource Conservation and Recovery Act (RCRA) under 40 CFR 261.24 set the regulatory limits for metals, VOCs, and SVOCs.

Regulatory limits of 5 mg/L for Lead concentrations. Regulatory limits for PCBs, as established by the Toxic Substance Control Act (TSCA), are 25 milligrams per kilogram (mg/kg) for removal and an action level of 50 mg/kg.

3.0 QUALITY ASSURANCE OBJECTIVES

As identified in Sections 1.0 and 2.0 the objective of this project/event applies to the following parameters:

Parameters	Matrix	Intended Use of Data	Objective
Metals	Soil	Site Characterization	QA2
PCB	Soil	Site Characterization	QA2
Volatile Organic	Soil	Site Characterization	QA2

4.0 APPROACH AND SAMPLING METHODOLOGIES

4.1 Sampling Equipment

The following equipment will be utilized to obtain environmental samples from the respective media/matrix:

Parameter/Matrix	Sampling Equipment	Fabrication	Dedicated
	1 N/A		

Parameter/Matrix	Sampling Equipment	Fabrication	Dedicated
Metals in Soil	Split Spoon	stainless steel	No

Decontamination Steps

Parameter/Matrix	Sampling Equipment	Fabrication	Dedicated
PCB in Soil	Split Spoon	stainless steel	No

Decontamination Steps

Parameter/Matrix	Sampling Equipment	Fabrication	Dedicated
volatile organics in Soil	Split Spoon	carbon steel	No

Decontamination Steps

4.2 Sampling Design

The sampling design is depicted on the attached Sample Location Map (Figure 4-1) and is based on the following rationale:

4.3 Standard Operating Procedures

4.3.1 Sample Documentation

All sample documents will be completed legibly, in ink. Any corrections or revisions will be made by lining through the incorrect entry and by initialling the error.

FIELD LOGBOOK

The field logbook is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. All entries will be dated and signed by the individuals making the entries, and should include (at a minimum) the following:

1. Site name and project number.
2. Name(s) of personnel on-site.
3. Dates and times of all entries (military time preferred).
4. Descriptions of all site activities, including site entry and exit times.
5. Noteworthy events and discussions.
6. Weather conditions.
7. Site observations.
8. Identification and description of samples and locations.
9. Subcontractor information and names of on-site personnel.
10. Date and time of sample collections, along with chain of custody information.
11. Record of photographs.
12. Site sketches.

SAMPLE LABELS

Sample labels will clearly identify the particular sample, and should include the following:

1. Site name and number.
2. Time and date sample was taken.
3. Sample preservation.
4. Analysis requested.

Optional, but pertinent, information is the sample location. Sample labels will be securely affixed to the sample container. Tie-on labels can be used if properly secured.

CHAIN OF CUSTODY RECORD

A Chain of Custody record will be maintained from the time the sample is taken to its final deposition. Every transfer of custody must be noted and signed for, and a copy of this record kept by each individual who has signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they must be stored in a locked container sealed with a Custody Seal.

The Chain of Custody record should include (at minimum) the following:

1. Sample identification number.
2. Sample information.
3. Sample location.
4. Sample date.
5. Name(s) and signature(s) of sampler(s).
6. Signature(s) of any individual(s) with control over samples.

CUSTODY SEALS

Custody Seals demonstrate that a sample container has not been tampered with, or opened.

The individual in possession of the sample(s) will sign and date the seal, affixing it in such a manner that the container cannot be opened without breaking the seal. The name of this individual, along with a description of the sample packaging, will be noted in the field logbook.

4.3.2 Sampling SOPs

PCBs in Air

Prior to actual air sampling procedures to identify suspected PCB contamination, contact EPA for information on flow rates and compounds of interest. Personal sampling pumps, and rotometer can be calibrated prior to field work, however, pump calibration must

be verified at sampling site.

Sample trains are assembled on-site. Tubing used to calibrate the pump should also be used for sampling. Once Gilian timers are set, and filter cassettes and florisil tubes are in place, sampling can begin.

At completion of sample period, florisil tube is removed, capped, and placed in a whirl bag. The cassettes 13-mm glass filter is removed and placed within a 7-ml vial. These samples, together with field blanks, lot blanks, and duplicates are shipped for analysis. It is essential that separate analyses be performed on the filter and florisil tube so as to differentiate PCB attached to particulate.

Soil Sampling

General Air Sampling Guidelines

(This SOP requires modifications for site specific applications)

AIR SAMPLING AND MONITORING

The objective of air sampling is to collect representative samples in order to determine concentrations of one or more pollutants originating from single or multiple sources. The laboratory procedure to be employed and the amount of sampling required often dictate the sampling procedure. The sampling and collecting medium or container are critical parameters in air sampling.

In general, the NIOSH Manual of Analytical Methods will be used as a reference for proper air sampling techniques. Additional air sampling references include:

Patty's Industrial Hygiene and Toxicology (3rd Ed.) and Air Sampling Instruments for Evaluation of Atmospheric Contaminants.

Since air sampling is such a diverse technology no single method or reference is best for all applications.

Air sampling for volatile organics and other compounds depends on sampling time, flow rate, sampling train, and various environmental factors, including humidity, temperature, and pressure.

Since the determination of the air contaminant is specifically dependent on the collection parameters and efficiencies, the collection procedure is an integral part of the analytical method.

CALIBRATION OF AIR SAMPLING DEVICES

Air sampling devices require calibration to determine the actual amount of air being sampled. Sampling trains may be calibrated against a primary, secondary, or intermediate calibration standard.

In primary calibration standards, gas flow is measured across a known volume. Examples of primary standards include:

bubble meters or Bucks Meter, Gilibrator frictionless piston, spirometers, etc.

AIR SAMPLING TRAINS

A typical air sampling train includes an air mover, a flow meter, and collection medium. The air mover may be a pump, squeeze bulb, vacuum source or similar device. There are two basic types of sampling pumps: centrifugal and displacement. Each type of pump has its advantages and disadvantages. The centrifugal pump can move large volumes of air, but, it cannot produce as much pressure as a compatible displacement pump. Displacement pumps are limited in flow rate by the volume and speed of each stroke, but are well suited for sampling when collection media are expected to have a high resistance flow.

Flow meters or flow measuring devices will be selected based upon the types of sampling pumps and accuracy required. A rotometer might be the measuring device of choice for a constant flow gas stream while a wet test meter would be more appropriate for a fluctuating flow.

SAMPLE COLLECTION EQUIPMENT

A wide variety of collection equipment has been utilized in sample acquisition. Some of the more common collection devices include filters, impingers, adsorbents, and condensers.

Filters can be constructed of either natural or synthetic material. A filter retains particles of a certain size and allows smaller particles to pass through. As particulates collect on a filter, filter cake builds up, which increases filtering efficiency. However, with the increased filter efficiency comes increased resistance flow. It is imperative to insure that the sampling pump being used is capable of maintaining constant flow throughout the resistance range expected.

An impinger is another device that may be utilized for particulate collection. An impinger directs a gas stream containing particulates against a hard surface or a liquid. The particles collide with this surface and lose their kinetic energy, thereby becoming trapped on the surface or in the liquid phase. The gas itself passes around the surface and through the liquid.

Adsorbents allow a specific molecule or group of molecules to adhere to their surfaces. Adsorbents may be either general or specific. For example, activated carbon is considered a general adsorbent because it can be used to sample a wide variety of volatile organics. Florisil, on the other hand, is more specific and is used almost exclusively for PCBs.

Condensers and cryogenic traps operate by lowering the temperature of a gas stream to below the boiling points of the pollutant being sampled, the gas or vapor condenses and is trapped in a reservoir. These devices have limited application because of many gases and vapors.

4.3.3 Sample Handling and Shipment

Each of the sample bottles will be sealed and labeled according to the following protocol. Caps will be secured with custody seals. Bottle labels will contain all required information including site name and sample number, time and date of collection, analysis requested, and preservative used. Sealed bottles will be placed in large metal or plastic coolers, and padded with an absorbent material such as vermiculite.

All sample documents will be affixed to the underside of each cooler lid. The lid will be sealed and affixed on at least two sides with custody seals so that any sign of tampering is easily visible.

4.4 Schedule of Activities

Table 1: Proposed Schedule of Work

Activity	Start Date	End Date
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5.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The EPA On-Scene Coordinator, Brad Benning, will provide overall direction to Ecology And Environment staff concerning project sampling needs, objectives and schedule.

The Ecology And Environment Task Leader, Steve Skare, is the primary point of contact with the EPA On-Scene Coordinator. The Task Leader is responsible for the development and completion of the Sampling QA/QC Plan, project team organization, and supervision of all project tasks, including reporting and deliverables.

The Ecology And Environment Site QC Coordinator, , is responsible for ensuring field adherence to the Sampling QA/QC Plan and recording any deviations. The Site QC Coordinator is also the primary project team contact with the lab.

The following sampling personnel will work on this project:

Personnel	Responsibility
Steve Skare	Project Manager

The following laboratories will be providing the following analyses:

Lab Name/Location	Lab Type	Parameters
Not Yet Determined	Not yet determined	

6.0 QUALITY ASSURANCE REQUIREMENTS

The following requirements apply to the respective QA Objectives and parameters identified in Section 3.0:

The following QA Protocols for QA2 data are applicable to all sample matrices and include:

1. Provide sample documentation in the form of field logbooks, the appropriate field data sheets and chain of custody records. Chain of custody records are optional for field screening locations.

2. All instrument calibration and/or performance check procedures/methods will be summarized and documented in the field/personal or instrument log notebook.
3. The detection limit will be determined and recorded, along with the data, where appropriate.
4. Document sample holding times; this includes documentation of sample collection and analysis dates.
5. Provide initial and continuing instrument calibration data.
- 6a. For soil, sediment and water samples, include rinsate blanks, field blanks and trip blanks, as specified in the attached table.
- 6b. For air samples, include lot blanks, field blanks, collocated samples, trip blanks, breakthrough, and QC positive samples, as specified in the attached table.
7. Performance Evaluation samples are optional, if available.
8. Choose any one or combination of the following three options:
 1. Definitive identification - confirm the identification of analytes on 10% of the screened (field or lab) or 100% of the unscreened samples via an EPA-approved method; provide documentation such as gas chromatograms, mass spectra, etc.
 2. Quantitation - provide documentation for quantitative results from screening and the EPA-approved verification method (for screened samples) or just the quantitative results (in the case of unscreened samples).
 3. Analytical error determination - determine the analytical error by calculating the precision, accuracy, and coefficient of variation on a subset of the screened or all of the unscreened samples using an EPA-approved method.

7.0 DELIVERABLES

The Ecology And Environment Task Leader, Steve Skare, will maintain contact with the EPA On-Scene Coordinator, Brad Benning, to keep him/her informed about the technical and financial progress of this project. This communication will commence with the issuance of

the work assignment and project scoping meeting. Activities under this project will be reported in status and trip reports and other deliverables (e.g., analytical reports, final reports) described herein. Activities will also be summarized in appropriate format for inclusion in monthly and annual reports.

The following deliverables will be provided under this project:

8.0 DATA VALIDATION

QA2

Data generated under this QA/QC Sampling Plan will be evaluated accordingly with appropriate criteria contained in the Removal Program Data Validation Procedures which accompany OSWER Directive #9360.4-1.

The results of 10% of the samples in the analytical data packages should be evaluated for all of the elements listed in Section 6.0 of the QA/QC Sampling Plan. The holding times, blank contamination, and detection capability will be reviewed for all remaining samples.

76th & Albany
Figure 1-1 Site Location Map

76th & Albany
Figure 4-1 Sample Location Map

TARGET COMPOUND LIST (TCL) AND QUANTITATION LIMITS (QL) (1)

Quantitation limits (2)

Water Low Soil/Sediment (3)

Volatiles	CAS Number	ug/L	ug/Kg
1. Chloromethane	74-87-3	10	10
2. Bromomethane	74-83-9	10	10
3. Vinyl Chloride	75-01-4	10	10
4. Chloroethane	75-00-3	10	10
5. Methylene Chloride	75-09-2	10	10
6. Acetone	67-64-1	10	10
7. Carbon Disulfide	75-15-0	10	10
8. 1,1-Dichloroethene	75-35-4	10	10
9. 1,1-Dichloroethane	75-34-3	10	10
10. 1,2-Dichloroethene (total)	540-59-0	10	10
11. Chloroform	67-66-3	10	10
12. 1,2-Dichloroethane	107-06-2	10	10
13. 2-Butanone	78-93-3	10	10
14. 1,1,1-Trichloroethane	71-55-6	10	10
15. Carbon Tetrachloride	56-23-5	10	10
16. Bromodichloromethane	75-27-4	10	10
17. 1,2-Dichloropropane	78-87-5	10	10
18. cis-1,3-Dichloropropene	10061-01-5	10	10
19. Trichloroethene	79-01-6	10	10
20. Dibromochloromethane	124-48-1	10	10
21. 1,1,2-Trichloroethane	79-00-5	10	10
22. Benzene	71-43-2	10	10
23. trans-1,3-Dichloropropene	10061-02-6	10	10
24. Bromoform	75-25-2	10	10
25. 4-Methyl-2-pentanone	108-10-1	10	10
26. 2-Hexanone	591-78-6	10	10
27. Tetrachloroethene	127-18-4	10	10
28. Toluene	108-88-3	10	10
29. 1,1,2,2-Tetrachloroeth	79-34-5	10	10
30. Chlorobenzene	108-90-7	10	10
31. Ethyl Benzene	100-41-4	10	10
32. Styrene	100-42-5	10	10
33. Xylenes (total)	1330-20-710	10	10

(1) Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

(2) Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment on dry weight basis will be higher.

(3) Medium Soil/Sediment Quantitation Limits (QL) for Volatile TCL Compounds are 125 times the individual Low Soil/Sediment QL.

Based on the Contract Laboratory Program Statement of Work, OLM01.6 (6/91).

TARGET COMPOUND LIST (TCL) AND
QUANTITATION LIMITS (QL) (1)
Quantitation Limits(2)
Water Low Soil/Sediment(3)

Semivolatiles	CAS Number	ug/L	ug/Kg
34. Phenol	108-95-2	10	330
35. bis (2-Chloroethyl) ether	111-44-4	10	330
36. 2-Chlorophenol	95-57-8	10	330
37. 1,3-Dichlorobenzene	541-73-1	10	330
38. 1,4-Dichlorobenzene	106-46-7	10	330
39. 1,2-Dichlorobenzene	95-50-1	10	330
40. 2-Methylphenol	95-48-7	10	330
41. 2,2-oxybis (1-chloropropane)	108-60-1	10	330
42. 4-Methylphenol	106-44-5	10	330
43. N-Nitroso-di-n-propylamine	621-64-7	10	330
44. Hexachloroethane	67-72-1	10	330
45. Nitrobenzene	98-95-3	10	330
46. Isophorone	78-59-1	10	330
47. 2-Nitrophenol	88-75-5	10	330
48. 2,4-Dimethylphenol	105-67-9	10	330
49. bis (2-Chloroethoxy) methane	111-91-1	10	330
50. 2,4-Dichlorophenol	120-83-2	10	330
51. 1,2,4-Trichlorobenzene	120-82-1	10	330
52. Naphthalene	91-20-3	10	330
53. 4-Chloroaniline	106-47-8	10	330
54. Hexachlorobutadiene	87-68-3	10	330
55. 4-Chloro-3-methylphenol	59-50-7	10	330
56. 2-Methylnaphthalene	91-57-6	10	330
57. Hexachlorocyclopentadiene	77-47-4	10	330
58. 2,4,6-Trichlorophenol	88-06-2	10	330
59. 2,4,5-Trichlorophenol	95-95-4	25	800
60. 2-Chloronaphthalene	91-58-7	10	330
61. 2-Nitroaniline	88-74-4	25	800
62. Dimethylphthalate	131-11-3	10	330
63. Acenaphthylene	208-96-8	10	330
64. 2,6-Dinitrotoluene	606-20-2	10	330
65. 3-Nitroaniline	99-09-2	25	800
66. Acenaphthene	83-32-9	10	330
67. 2,4-Dinitrophenol	51-28-5	25	800
68. 4-Nitrophenol	100-02-7	25	800
69. Dibenzofuran	132-64-9	10	330
70. 2,4-Dinitrotoluene	121-14-2	10	330
71. Diethylphthalate	84-66-2	10	330
72. 4-Chlorophenyl-phenylether	7005-72-3	10	330
73. Fluorene	86-73-7	10	330
74. 4-Nitroaniline	100-01-6	25	800
75. 4,6-Dinitro-2-methylphenol	534-52-1	25	800

76.	N-nitrosodiphenylamine	86-30-6	10	330
77.	4-Bromophenyl-phenyl ether	101-55-3	10	330
78.	Hexachlorobenzene	118-74-1	10	330
79.	Pentachlorophenol	87-86-5	25	800
80.	Phenanthrene	85-01-8	10	330
81.	Anthracene	120-12-7	10	330
82.	Carbazole	86-74-8	10	330
83.	Di-n-butylphthalate	84-74-2	10	330
84.	Fluoranthene	206-44-0	10	330
85.	Pyrene	129-00-0	10	330
86.	Butylbenzylphthalate	85-68-7	10	330
87.	3,3-Dichlorobenzidine	91-94-1	20	660
88.	Benzo(a)anthracene	56-55-3	10	330
89.	Chrysene	218-01-9	10	330
90.	bis(2-Ethylhexyl)phthalate	117-81-7	10	330
91.	Di-n-octylphthalate	117-84-0	10	330
92.	Benzo(b)fluoranthene	205-99-2	10	330
93.	Benzo(k)fluoranthene	207-08-9	10	330
94.	Benzo(a)pyrene	50-32-8	10	330
95.	Indeno(1,2,3-cd)pyrene	193-39-5	10	330
96.	Dibenz(a,h)anthracene	53-70-3	10	330
97.	Benzo(g,h,i)perylene	191-24-2	10	330

- (1) Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.
- (2) Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment on dry weight basis will be higher.
- (3) Medium Soil/Sediment Quantitation Limits (QL) for Semivolatile TCL Compounds are 60 times the individual Low Soil/Sediment QL.

Based on Contract Laboratory Program Statement of Work, OLM01.6 (6/91).

TARGET COMPOUND LIST (TCL) AND
QUANTITATION LIMITS (QL) (1)

Quantitation Limits(2)
Water Low Soil/Sediment(3)

Pesticides/PCBs	CAS Number	ug/L	ug/Kg
98. alpha-BHC	319-84-6	0.05	1.7
99. beta-BHC	319-85-7	0.05	1.7
100. delta-BHC	319-86-8	0.05	1.7
101. gamma-BHC (Lindane)	58-89-9	0.05	1.7
102. Heptaclor	76-44-8	0.05	1.7
103. Aldrin	309-00-2	0.05	1.7
104. Heptachlor epoxide	1024-57-3	0.05	1.7
105. Endosulfan I	959-98-8	0.05	1.7
106. Dieldrin	60-57-1	0.10	3.3
107. 4,4'-DDE	72-55-9	0.10	3.3
108. Endrin	72-20-8	0.10	3.3
109. Endosulfan II	33213-65-9	0.10	3.3
110. 4,4'-DDD	72-54-8	0.10	3.3
111. Endosulfan sulfate	1031-07-8	0.10	3.3
113. 4,4'-DDT	50-29-3	0.10	3.3
114. Methoxychlor	72-43-5	0.50	17.0
115. Endrin ketone	53494-70-5	0.10	3.3
116. Endrin aldehyde	7421-36-3	0.10	3.3
117. alpha-Chlordane	5103-71-9	0.5	1.7
118. gamma-Chlordane	5103-74-2	0.5	1.7
119. Toxaphene	8001-35-2	1.0	170.0
120. Aroclor-1016	12674-11-2	0.5	33.0
121. Aroclor-1221	11104-28-2	0.5	33.0
122. Aroclor-1232	11141-16-5	0.5	67.0
123. Aroclor-1242	53469-21-9	0.5	33.0
124. Aroclor-1248	12672-29-6	0.5	33.0
125. Aroclor-1254	11097-69-1	1.0	33.0
126. Aroclor-1260	11096-82-5	1.0	33.0

- (1) Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.
- (2) Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment on dry weight basis will be higher.
- (3) Medium Soil/Sediment Quantitation Limits (QL) for Pesticides/PCB TCL compounds are 15 times the individual Low Soil/Sediment QL.

Based on the Contract Laboratory Program Statement of Work, OLMO1.6 (6/91).

INORGANIC TARGET ANALYTE LIST (TAL)

Detection Limit

Analyte	(ug/L -- water (1))
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

(1) Sediment detection limit 100x water (ug/kg -- soil/sediment).

Based on the Contract Laboratory Program Statement of Work, ILMO2.1 (9/91).